

## A BASIC LIST OF THE FRESH WATER MOLLUSCA OF AUSTRALIA.

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*(Contribution from The Australian Museum, Sydney, N.S.W.)*

This was prepared as a necessary sequel to the Basic List of the Land Mollusca, which has appeared in this Journal. It was found that so little was known, and the problems so intricate that it was placed on one side, but recently the danger of Schistosomiasis has urged its publication. It is a very Basic List, as studies suggest many additions, and probably also many emendations. There is probably no group of which the members show so much variation, the causes of which are at present inexplicable. In Europe and America, where very intensive study has taken place, there seems little finality as to species and genera, so that our ignorance may be excusable.

Sixty years ago, E. A. Smith, of the British Museum, furnished the first list in the Journal of the Linnean Society of London (Zool., Vol. xvi., pp. 255-317, pls. v.-vii.). The paper was read on April 21, 1881, but not published until April 6, 1882. In the meanwhile, ignorant of their English friend's action, Tate and Brazier issued a Check List in the Linnean Society of New South Wales' Proceedings (Vol. vi., pp. 552-569), which appeared in December, 1881. The latter was purely a compilation without "critical remarks of our own," and consequently produced no novelties. In Smith's essay, on the other hand, many new species were introduced and figured, and a critical review as far as possible prepared. Ignorant of local conditions, and with little material, such an excellent list was prepared that no other has since appeared. Yet a number of papers has appeared in recent years dealing with local states by local workers, so that there is a large series of illustrations to refer to. Hedley reported upon the "Victorian species of *Bullinus*" (Rec. Austr. Mus., Vol. xii., pp. 1-8, pls. i.-ii., December 19th, 1917), and Gabriel has listed the whole of the fresh water mollusca of Victoria (Mem. Nat. Mus. Melb., No. 11, pp. 100-139, pls. i.-iii., November, 1939). May criticised the numerous species that had been described from Tasmania by those energetic workers, Tenison-Woods, Petterd and Johnston, in the Papers Proc. Roy. Soc. Tasm., 1920, pp. 65-75, pls. ix.-xii., September 14, 1920. [It may be here noted that to E. A. Smith, Tasmania was not Australia, and Tasmanian species were not included in his account.] Cotton and Godfrey listed the South Australian species (South Austr. Nat., Vol. xiii., pp. 156-165, pls. 2 and 3, August, 1932), and Cotton has since reviewed some members (Trans. Roy. Soc. South Austr., Vol. 66, pp. 75-82, pls. i.-ii., July 31, 1942), and also reported upon the Viviparidae of Australia, and suggests he will continue. I have to thank Mr. Cotton for study of a long series of South Australian forms, with the hope that we would together contribute an account, but pressure of other work has delayed that task, and I am very glad Mr. Cotton is doing it. I prepared an account of the Fresh Water Mussels of Australia, which has appeared in this Journal, Vol. viii., pp. 57-78, pls. iii.-vi., May 9, 1934. The present essay hopes to bring all these papers into review along with species from Northern Australia and Queensland not yet listed.

The first necessity is a knowledge of the river systems of Australia as these molluscs are more or less tied down to these factors. So far all the recent acquisitions have confirmed the broad lines Whitley and I laid down in a short paper, "The Fluvifaunulae of Australia" (South Aust. Nat., Vol.

xviii., pp. 64-68, April 30, 1938), including a map. The map requires a little re-drafting in a few details, but on the whole it shows the basis of our fresh water faunulae pretty well. In that place the Leichhardtian Fluvifaunula was that inhabiting the rivers of the Northern Territory from Port Essington eastwards and Queensland, west of Torres Straits. Unfortunately the dotted line showing these limits is drawn from Derby to the Roper River, a palpable and unforgivable error. The Greyian Fluvifaunula, inhabiting the rivers of the Dampierian Sub-Area is little known as yet, and here the dotted line on the map starts at Shark's Bay, which is correct, but finishes at the De Grey River, instead of continuing up to, at least, Wyndham. The Vlaminghian Fluvifaunula is that of the Leeuwinian Area, the south-west of Western Australia, while the Sturtian Fluvifaunula inhabits the rivers and lakes of the Centralian or Larapintine Area. The Mitchellian Fluvifaunula is that of the Darling, Murrumbidgee, Murray and their tributaries and the river captures of South Eastern Queensland. The Lessonian Fluvifaunula is restricted to the rivers of Eastern New South Wales, Victoria and North Tasmania, while the Tobinian Fluvifaunula is known only from the southern portion of the Maugean Sub-Area. The Krefftian Fluvifaunula practically occupies the rivers of the Oxleyan Sub-Area, while the Jardinean Fluvifaunula is named for the Torresian portion of the Solanderian Sub-Area. These names are preferable to State names as they really determine zoological areas, while two or three zoological areas may occur in one State. By observing these fluvifaunal limits possibility of error is much decreased, and we do not record named species for localities, wherein they could not occur, as, for instance, "Sydney and the Swan River," "St. Margarets, South Australia and Cardwell, North Queensland," etc., etc.

#### CLASS PELECYPODA.

The bivalve molluscs of fresh water are mainly referable to three series, the so-called fresh water mussels and the small Corbiculids and peashells. The former were listed and illustrated in this Journal (Vol. viii., pp. 57-78, pls. iii.-vi., May 9, 1934), where full references were given. In the intervening years much additional material has been acquired, fully confirming the classification there proposed. To save space the details of the paper will not be here repeated, but the summary at the end is reprinted for convenience in connection with the following notes.

#### Family PROPEHYRIDELLIDAE.

As suggested this family may be polyphyletic, but until intensive research is undertaken on this group, the name may be tentatively utilised.

#### Subfamily VELESUNIONAE.

In this subfamily the beaks are smooth, and the shells vary in size from about 50 mm. to 170 mm. or over in length.

*Velesunio balonnensis* Conrad. Type locality, Balonne River, N.S.W., a tributary of the Darling River system. Richmond River provided a subspecies, *V. b. adjunctus*, and specimens from Rockhampton, Queensland, were also regarded as a subspecies, *V. b. intricatus*. These may prove to be distinct species.

*Velesunio danellii* Villa = *jeffreysianus* Lea, is the south Victorian species, but this appears to be living in the Irrigation Area of New South Wales.

*Velesunio shuttleworthi* Kuster = *vittatus* Lea = *moretonicus* Reeve = *legrandi* Petterd, lives only in the northern rivers of Tasmania, no mussels occurring in the southern portion of that island.

*Velesunio evansi* A. Adams and Angas, is the South Australian species.

*Westralunio ambiguus* Philippi is the Western Australian representative of the Eastern *Velesunio*. It was renamed *philippianus* by Kuster; and the type locality is King George's Sound, a subspecies being named *W. a. carteri* from the Perth district.

*Alathyria profuga* Gould, was named from the Hunter River, a coastal river, but the large species referred to the genus *Alathyria* are more common in the Darling River system, the species living there being named

*Alathyria jacksoni* Iredale, while a third species,

*Alathyria pertexta* Iredale, occurs in the mid and south Queensland rivers.

*Centralhyria stuarti* A. Adams and Angas, occurs in northern South Australia, while

*Centralhyria wilsonii* Lea, described from coastal mid-Queensland, apparently ranges across tropical Australia, a subspecies, *C. w. caurina*, being named from May River, north-west Australia.

*Centralhyria* (or better, *Aparcthyria*) *angasi* Sowerby, occurs northward of the preceding, the type locality being the Strangway River, a tributary of the Roper River, a subspecies, *C. a. subjecta*, being named from the "Membridge River."

*Centralhyria bednalli* Tate, was described from the River Adelaide, at the ford, Northern Territory, and is at present unrecognised nor figured.

*Hyridunio australis* Lamarck, is determined as a local Sydney species, with a subspecies, *H. a. orion*, from Victoria, and another, *H. a. drapeta*, from the Brisbane River, Queensland.

*Hyridunio renutus* Iredale, is a Gippsland, Victoria, species.

#### Subfamily LORTIELLINAE.

*Lortiella rugata* Sowerby, from the Victoria River, Northern Territory, and *Lortiella froggatti* Iredale, from the Lennard River, North-west Australia.

#### Subfamily PROPEHYRIDELLINAE.

*Rugoshyria depressa* Lamarck = *mutabilis* Lea = *paramattensis* Lea, from New South Wales, with three subspecies in the south, *R. d. monticola* from Mount Kosciusko, *R. d. vicinalis* from Gippsland, Victoria, and *R. d. sodalis* from Tasmania.

*R. interserta* Iredale, replaces this in mid-Queensland, and a different species, *R. aquilonalis* Iredale, lives in North Queensland (mayhap a distinct genus).

*R. cultelliformis* Conrad, occurs inland in northern New South Wales.

*Propehyridella nepeanensis* Conrad = *dorsuosus* Gould = *lessoni* Kuster, lives in mid-New South Wales, *P. n. opportuna* being a larger form in the north of the State, and *P. n. narracanensis* Cotton & Gabriel, replaces it in eastern Victoria.

*P. glenelgensis* Dennant, a very curious shell, occurs in western Victoria.

## Subfamily CUCUMERUNIONAE.

*Cucumerunio novaehollandiae* Gray = *cucumoides* Lea = *cumingianus* Dunker, a magnificent shell, inhabits northern New South Wales and South Queensland. Since this appeared, Mr. Melbourne Ward, interested in fresh water crustacea, asked his correspondents to collect fresh water mussels at the same time, and he has presented a series to the Museum. These have proved very interesting, as they confirm all the propositions above cited. Thus from Deniliquin, N.S.W., on the Murray River system, the shells are *Velesunio evansi*. From Narrandera (Murrumbidgee River), New South Wales specimens of a large thick *Alathyria* simulating *profuga* rather than *jacksoni*, and from Condobolin (Lachlan River), N.S.W., large specimens like *jacksoni* are accompanied by shells like the Narrandera form, suggesting a distinct species.

From places on the Darling River system shells of *Velesunio* are of the *balonnensis* type, but similar specimens came from Charleville, Queensland, an unexpected locality, but the map showed that the Warrego River, a tributary of the Darling, reached to that locality.

However, from Wenlock Downs, Batavia River (flowing into Gulf), North Queensland, an *Aparcthyria* of small regular shape, black outside, blue internally, with long slender typical teeth. The shell measures 59 mm. by 37 mm. by 23 mm., smaller, more swollen, anterior end more pronounced than in *angasi*, and may be named *A. hemesa* sp. nov. Among aboriginal material from Cape York came large mussels (worked) in size recalling *Alathyria*, and specimens from Einasleigh River, North Queensland, provide the solution. The shell is large, measuring 120 mm. in length by 64 mm. in height and 46 mm. depth of conjoined valves. While similar to *Alathyria* the shell is notably winged, attenuate posteriorly, and has a distinct concentric sculpture, which develops frilling marginad, more strongly developed posteriorly. A larger specimen reaches 135 mm. by 75 mm. by 45 mm., the sculpture even stronger. The teeth are comparatively delicate, the pseudo cardinals small, elongate, decreasing with age, as also do the long slender laterals. The muscle scars are lightly impressed, the protractor pedis small elongate, the anterior p.p. fused.

This may be designated *Quaesithyria wardi* gen. et sp. nov., the type of the genus. A second species was collected by Dr. H. Flecker, in the Hodgkinson River North Queensland, and agrees generally, but is smaller, 90 mm. by 45 mm. by 25 mm., and differs in lacking the frilling, though concentric sculpture is present. In form, the wing is less elevated, and the ventral line is straight, and this may be called *Quaesithyria fleckeri* sp. nov.

Mr. Melbourne Ward also collected a series near Darwin, Northern Territory, showing slight differences in each locality. Thus, from Holmes Creek, 12 miles north-east of Darwin, two sets are seen, one from one pond being large, 75 mm. by 44 mm., thin, not much eroded, rather strongly winged, ventral border curved, while from another pool the shells are much smaller, 60 mm. by 37 mm., more solid, more eroded, not so much winged, and ventral border straight. From Bankier's Jungle Creek, Koolpinyal Station, 30 miles inland from Darwin, the shells are small, stout, eroded, the posterior side rather sharply truncate, thus giving it quite a different appearance from the preceding in form, and recalling the figure of the missing Membridge River form; it measures 48 mm. by 30 mm. From Howard Creek, on the same station, the shells are small, largest 55 mm. by 30 mm., but elongate, the posterior end not truncate, and looking quite

different. From Lake Deane, 40-45 miles from Darwin, large shells were found, 75 mm. by 44 mm., similar to the first one mentioned. I conclude these are all merely ecologic variations of the one species, which may be called *Aparcthyria inspecta* sp. nov., the type being the large Holmes Creek shell, as they all differ from *A. angasi* in their more pronounced winging.

Nearer Sydney, Elkington Allen has been studying these molluscs, and has collected some interesting species, finding very large *Propehyridella nepeanensis* in the Woronora River, exceeding the size of the Richmond River form, and at Dubbo he collected very large *Alathyria jacksoni*, reaching 170 mm. by 92 mm., thus confirming the early explorers, who reported "Mussels over six inches in length were met with in these rivers." This shows what a lot there is to be done in this group alone.

#### Family GELOINIDAE.

This family has been commonly called Cyrenidae, the Lamarckian name *Cyrena* being used for the large subcircular brackish water black molluscs, but it has now been rated as a synonym of *Corbicula*. Tate and Brazier listed a dozen names, but Hedley only recognised two, one *Cyrena* and one *Batissa* in his Marine Mollusca of Queensland. None is really a fresh water mollusc, but specimens commonly occur in fresh water rivers, but only within the range of tidal influence. Thus the two listed by Hedley were abundant up the Daintree River at the Dairy Factory, where the water is absolutely fresh, while they also lived in the mangroves at Low Isles, where the water is always salt, and there appeared not the slightest difference in the shells. Though Deshayes described three species from Australia, and Prime, Mousson and Sowerby one each, Hedley lumped them all under the Cingalese name *coaxans* Gmelin. Prashad had used Solander's name *erosa*, in preference to Gmelin's name, but that is certainly incorrect. In the Portland Catalogue, p. 186, ante April 24, 1786, is printed—

"Lot 3961. Venus Erosa S., a very curious undescribed species of fresh water bivalve (sic), with a black epidermis, and fine purple inside, the country unknown, very rare."

Humphrey, Museum Calonianum, p. 59, May, 1797, added "Genus Capsa. 1089. Violacea. New South Wales. Venus Erosa Soland. Extremely scarce. M.P. 3961."

If this entry were to be accepted, it obviously refers to a *Batissa*, as no *Geloina* (= *Cyrena*) is purple inside, but pure white, while the *Batissa* is characterised by that coloration. Both the *Geloina* and *Batissa* occurred together at the Daintree River, which is not far from Cooktown, the only place in Queensland (= New South Wales in 1797), where Cook's party might have met with these molluscs.

#### Family CORBICULIDAE.

This family includes all the small fresh water bivalves gregariously met with, and at present all the Australian species are referred to the one genus *Corbiculina*, but there appears to be evidence of more than one, but the matter cannot be discussed here.

#### Genus CORBICULINA.

1903. *Corbiculina* Dall, Trans. Wagner Free Inst. Sci., Philad., Vol. iii., p. 1449, October. Orthotype, *Corbicula angasi* Prime.

## CORBICULINA ANGASI.

1864. *Corbicula angasi* Prime, Journ. de Conch., Vol. xii., p. 151, pl. vii., fig. 6, April 1. River Murray, South Australia.
1877. *Corbicula rivina* Clessin, Syst. Conch. Cab. (Martini & Chemnitz), ed. Kuster, Bd. ix., Abth. iii., p. 139, pl. 25, figs. 3, 4. Murray River, Australia.

## CORBICULINA AUSTRALIS.

1830. *Cyrena australis* Deshayes, Ency. Meth. Vers, Vol. ii., p. 50, sign G, ex Lesson. New Holland = Nepean River, N.S.W.
1831. *Cyclas nepeanensis* Lesson, Voy. Coquille, Zool., Vol. ii., p. 428; Atlas, Moll., pl. xiii., fig. 14. Nepean River, N.S.W. Refigd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 300, pl. vii., figs. 26-27, 1882.

## CORBICULINA DEBILIS.

1850. *Cyrena debilis* Gould, Proc. Bost. Soc. Nat. Hist., Vol. iii., p. 293 (dated November), New Holland ? = Figd. U.S. Expl. Exped., Vol. xii., p. 427, pl. xxxvi., fig. 529, a-b, 1852. = Hunter River, N.S.W.
1882. *Corbicula sublaevigata* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 304, pl. vii., figs. 30-31, April 6. Lochinvar (near Newcastle), Australia. (Dr. Sinclair, R.N.).

CORBICULINA FINKEANA, *sp. nov.*

1896. *Corbicula sublaevigata* Tate, Rep. Horn. Sci. Exped. Cent. Austr., pt. ii., Zool., p. 217, February. River Finke, Central Australia.

Subequilateral, anterior end shorter, pointed, posterior and well rounded. Sculpture weak but fairly regular grooving. Disagrees with Smith's figure and description of "Lochinvar" shell above cited.

## CORBICULINA FABA.

1904. *Corbicula faba* Bullen, Proc. Malac. Soc. (Lond.), Vol. vi., p. 110, pl. vi., figs. 10-11, June 23. Richmond River, New South Wales.

## CORBICULINA BARONIALIS.

1870. *Corbula baronialis* Prime, Ann. Lyc. Nat. Hist. New York, Vol. ix., p. 300, March; ex Amer. Journ. Conch., Vol. 5, pt. 2; appendix, p. 123, October 7, 1869, *nomen nudum*. Moreton Bay, Australia.  
Not yet figured.

## CORBICULINA MINOR.

1861. *Corbicula minor* Prime, Proc. Acad. Nat. Sci. Philad., 1861, p. 127, September 30. Hab. ? Figd. Ann. Lyc. Nat. Hist. New York, Vol. viii., p. 80, fig. 29, 1864. New Holland.

This name has been used for any small form, but should be rejected entirely, as the figure is exactly indeterminable without accurate locality.]

## CORBICULINA PROLONGATA.

1861. *Corbicula prolongata* Prime, Journ. de Conch, Vol. ix., p. 356, October 1. Figd., Vol. x., p. 389, pl. xiv., fig. 6, October 1, 1862. Australia = Wide Bay, Queensland, fide Smith.

## CORBICULINA OVALINA.

1855. *Corbicula ovalina* Deshayes, Cat. Bivalve Shells Brit. Mus., pt. ii., p.

229, May 12, 1855; Proc. Zool. Soc. (Lond.), 1854, p. 343, May 16, 1855. Port Essington, Australia. Figd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 299, pl. vii., figs. 24-25, 1882.

At the same place, p. 230, Deshayes described *C. semisulcata*, as from "Victoria River, New Holland," but Prime, and also Smith, stated the shells came from South America, and Smith described the succeeding species.

CORBICULINA DESHAYESII.

1882. *Corbicula deshayesii* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 303, pl. vii., figs. 28-29, April 6. Victoria River, North Australia.

CORBICULINA MUSSONI, *sp. nov.*

A large series of shells collected by Musson at Narrabri, Namoi River, was separated into sets and given various names, smallest, *minor*, oval ones, *ovalina*, others *nepeanensis*, but the whole series differs from *australis* in form, being comparatively deeper, less oval, ribbing coarser, and are nearer *angasi*, but have the ribs more distant than in that species. The type measures 25 mm. long by 19 mm. high.

CORBICULINA SEMARA, *sp. nov.*

Many specimens have been collected in North Queensland, which are all small, oval, and rather regularly distantly grooved, the type from the Burdekin River measuring 15 mm. long by 12 mm. high. Another series from further north are less oval, the ends less rounded, the hinge line more arched, and especially have close fine grooving. The type from the Barron River (above the Falls), North Queensland, may be called *C. aramita* *sp. nov.*, the shell measuring 12 mm. long by 10 mm. high.

CORBICULINA PERMENA, *sp. nov.*

While attempting to include all local shells under "*nepeanensis*" there was much difficulty, and Yass specimens differed at sight, being equilateral with sloping sides, measuring 18 mm. by 15.5 mm. by 10 mm., and the sculpture was more defined and the ribs closer together. These should be nearer *angasi*, but the sculpture is finer, and the form is more trigonal.

CORBICULINA DESOLATA.

1887. *Corbicula desolata* Tate, Trans. Roy. Soc. South Austr., Vol. ix., p. 67, pl. iv., figs. 11 a-b., March. (Separates issued, ante December 29, 1886.) Cooper's Creek, Innamincka, Central Australia.

CORBICULINA MAROUBRA, *sp. nov.*

Mr. G. P. Whitley collected a strange valve on the sand at Maroubra, N.S.W., and later many, including freshly dead specimens, of a very distinct species. It is very trigonal, thick, with heavy concentric ribs, measuring 20 mm. long by 19 mm. high. It is covered with a very dark brown periostracum, and at every stage differs from any form of *australis*. It suggests that there may be more than one form of *Corbiculina*, as the hinge in this one is strongly arched, almost angulate, quite unlike the gentle slope of true *Corbiculina*.

CORBICULINA ESCULENTA, *sp. nov.*

Specimens from Armidale, north New South Wales, differed slightly from *australis*, but a series just received from Mrs. Consett Davis, collected at the Blue Hole, apparently reach a very large size, the type measuring 30

mm. by 22 mm. The anterior end is produced almost angulately, and the posterior is also produced, the ventral margin curved, and the sculpture regular fine grooving, the hinge line long, the teeth well spread, the cardinals very stout.

Family SPHAERIIDAE.

The small bivalves referred to this family apparently constitute a study in themselves, as after a book had been written about the British species, seventeen in number, a few years later a long article was published explaining how to determine them. Analogically, it may take a century to discriminate the Australian forms. However, the extralimital experts have stated that our species are not referable to the original genera, and even suggested they may not belong to the family. The most we can do at present is to catalogue the species geographically, and hope some one will later undertake the elucidation of the group. European students separate two large groups, *Sphaerium* sensu latissimo, with two siphons, and *Pisidium*, sensu latissimo, with only one siphon. The shell characters differentiating each need careful criticism, though really the appearance is commonly sufficient to separate them.

Genus SPHAERINOVA, *gen. nov.*

Type, *Sphaerium macgillivrayi* Smith.

The hinge is much weaker, the teeth disagreeing with those of the type of *Sphaerium*, the cardinals small, and the laterals delicate, recalling somewhat a degenerate *Pisidium* hinge line.

SPHAERINOVA MACGILLIVRAYI.

1882. *Sphaerium macgillivrayi* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 305, pl. vii., fig. 34, April 6. Penrith, New South Wales (Macgillivray).

SPHAERINOVA TATIARAE.

1938. *Sphaerium tatiarae* Cotton & Godfrey, Molluscs South Australia, Pt. I., Pelecypoda, p. 178, fig. 181 in text, March. Tatiara Creek, Bordertown, South Australia.

Gabriel has figured and described the Victorian representative (Memoirs. Nat. Mus. Melb., No. 11, p. 127, pl. iv., fig. 35, November, 1939) under the name *Sphaerium tasmanicum* Ten.-Woods, with which he synonymised *S. macgillivrayi*. As the Victorian shell is obviously neither of these distinct species, it may be called *Sphaerinova victoriana* sp. nov., Tarraville being the type locality. May separated the species from the Great Lake, Tasmania, as *macgillivrayi*, restricting *tasmanicum* to the low land southern species. May's illustration (Illus. Index Tasm. Shells, pl. ix., fig. 8, 1923) is unlike the northern shell, and is here named *Sphaerinova lacusedes* sp. nov. Specimens from Nundle, northern New South Wales, also differ from topotypes in their more elongate form, anteriorly produced, posteriorly truncate, growth lines obsolescent, and are separated as *Sphaerinova nundinalis* sp. nov., the type measuring 7.5 mm. by 5.5 mm.

SPHAERINOVA TASMANICA.

1876. *Cyclas tasmanica* Tenison-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 82, March 21, 1876. Swansea, east coast Tasmania. Figd. May, Papers Proc. Roy. Soc. Tasm., 1920, p. 68, pl. ix., fig. 1, September 14, 1920.

1879. *Calyculina tasmaniae* Clessin, Syst. Conch. Cab. (Martini & Chemnitz) ed. Kuster, Band ix., Abth. iii., p. 261, pl. 41, figs. 1-2. Tasmania.

SPHAERINOVA QUEENSLANDICA.

1882. *Sphaerium queenslandicum* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 305, pl. vii., fig. 33, April 6. Limestone Creek, Burdekin River, Queensland.

SPHAERINOVA TRANSLUCIDA.

1876. *Sphaerium translucidum* Sowerby, Conch. Icon. (Reeve), Vol. xx., pl. v., fig. 46. Palmtree Creek, Australia. Refigd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 305, pl. vii., fig. 32, April 6, 1882.

SPHAERINOVA PROBLEMATICA.

1939. *Sphaerium problematicum* Gabriel, Mem. Nat. Mus. Melb., No. 11, p. 128, pl. iv., figs. 36, a-b, November. Murray River, Victoria.

Genus AUSTRALPERA, nov.

Type, *Pisidium etheridgii* Smith.

The characteristic external ligament of *Pisidium* is missing here, and the teeth are so unlike that they have been suggested as of Lasaeid relationship, while the shell is fragile, unlike the northern forms.

AUSTRALPERA ETHERIDGII.

1882. *Pisidium etheridgii* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 306, pl. vii., fig. 35, April 6. Yau Yean (sic) Reservoir, Plenty District, Victoria.

The South Australian shells seem inseparable, though Cotton's figure looks different, but those from New South Wales are larger, deeper, the anterior end shorter, and the sculpture more pronounced, and may be named *A. bradana* sp. nov., the type from Braidwood, N.S.W., measuring 9 mm. long by 7 mm. high.

AUSTRALPERA TASMANICA.

1876. *Pisidium tasmanicum* Tenison-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 81, March 21, 1876. Brown's River, Tasmania. Figd. May, Papers Proc. Roy. Soc. Tasm., 1920, p. 68, pl. ix., fig. 3, September 14.

AUSTRALPERA (?) DULVERTONENSIS.

1876. *Pisidium dulverttonensis* Tenison-Woods, Papers, Proc. Roy. Soc. Tasm., 1875, p. 82, March 21, 1876. Lake Dulverton, Tasmania. Figd. May, Papers Proc. Roy. Soc. Tasm., 1920, p. 68, pl. ix., fig. 2, September 14 (type). Transferred to *Sphaerium*, May, Illus. Index Tasm. Shells, pl. ix., fig. 7, 1923.

Note:—There is something wrong here, as May's figure of "type" does not agree at all with Tenison-Woods' description.

AUSTRALPERA SEMEN.

1843. *Pisidium semen* Menke, Moll. Nov. Holl. Spec., p. 40, April. West Australia.

Note:—Hedley dredged a small shell, measuring 3 mm. by 2½ mm. from 35 feet, Blue Lake, Mount Kosciusko, recalling May's illustration of *tasmanica* above cited, but, of course, deeper, and with strong concentric ridges

and heavier teeth in the hinge. It is better referable to a new genus to be called *Glacipisum kosciusko* gen. and sp. nov.

#### Family NERITIDAE.

Smith reported "Genus *Neritina*. Of this genus, as far as I can ascertain, only two species undoubtedly live in fresh water, namely, *N. crepidularia* and *N. pulligera*. The former he recorded "Inlet next to Percival Bay, fresh water" (Dr. Richardson); "swamp two miles north of Cardwell, Queensland (Brazier)," while, for the latter, he accepted *N. pulligera* var. *sulcata* Ten.-Woods. "In the mountain streams of the Bellenden-Ker ranges, North Queensland." Nine other species were named as being recorded, but these are all rejected as marine, though possibly some may occur in fresh water under tidal influence. It would also be wise to reject the two named by Smith above as though specimens have been found in fresh water, these only occur under circumstances showing their marine association. Two species of so-called "*crepidularia*" occur in brackish and fresh water adjacent in Queensland, and the *sulcata* Ten.-Woods, was probably also collected in a similar place. Thus I collected a shell in a fresh water rill on a hillside running into the Daintree River, many miles from the mouth, but the river was still under tidal influence. So far no species has been found living away from rivers subject to tidal influence.

#### Family VIVIPARIDAE.

The members of this family have been recently listed by Cotton (Rec. South Austr. Mus., Vol. v., pp. 339-344, September 30, 1935, and also in the Vict. Nat., Vol. lii., p. 97, text fig., October, 1935), so there is little to comment on. Cotton introduced two new generic names, *Notopala* and *Centrapala*, but the famous Indian authority on fresh water molluscs, Prashad, had discussed "Recent and Fossil Viviparidae. A Study in Distribution, Evolution and Palaeogeography" (Mem. Indian Mus., Vol. viii., pp. 153-251, February, 1928). Therein Prashad suggested independent evolution of the Australian forms, and distinguished three groups (p. 178), thus "Vivipari Sublineata Group," including *sublineata* Conrad, *intermedia* Reeve, and *alisoni* Brazier; "Vivipari Ampullaroides Group," with *V. ampullaroides* Reeve, *waterhousei* Ad. & Ang., *kingi* Ad. & Ang., *tricinctus* Smith, and *dimidiatus* Smith; and the "*Larina*" group, an estuarine series, including the Cingalese *Robinsonia* and the Papuan *Glaucostracia*. Cotton proposed *Notopala*, with *hanleyi* Frauenfeld as type, for use for the whole series, except the lirate Centralian form, and *Larina*. Prashad would separate the northern series, the name *Notopala* belonging to the *sublineata* series. It may be as well to arrange our shells in that manner, and instead of the clumsy group serial name use a subgeneric name *Notopalena* nov., with *essingtonensis* Frauenfeld, as type. Although Prashad regarded *Larina* as an estuarine group, Hedley many years ago pointed out that it was truly a fresh water mollusc. *Robinsonia* does not appear a close ally, and *Glaucostracia*, though closer geographically, has also a distinct appearance.

#### Genus NOTOPALA.

1935. *Notopala* Cotton, Rec. South Austr. Mus., Vol. v., p. 339, September 30. Orthotype, *Paludina hanleyi* Frauenfeld.

#### NOTOPALA HANLEYI.

1864. *Paludina hanleyi* Frauenfeld, Verhandl. k.k. zool. bot. Gesellsch. Wien., 1864, Bd. xiv., p. 612. New name for .

1863. *Paludina intermedia* Reeve, Conch. Icon., Vol. xiv., pl. ix., sp. 57, April, ex Hanley MS. Hab.? Not *P. intermedia* Melleville, Ann. Sci. Geol. ii., 1843, p. 96 (C.D.S.).
1865. *Paludina (Vivipara) purpurea* Martens, Malak. Blätter, Vol. xii., p. 150, August?. Australia = Murray River, December, 1865 (Kreff), see A.M.N.H., Ser. 3, Vol. xvi., p. 428.
1935. *Notopala hanleyi* Cotton, Vict. Naturalist, Vol. lii., p. 97, text fig., October.

## NOTOPALA SUBLINEATA.

1850. *Paludina sublineata* Conrad, Proc. Acad. Nat. Sci. Philad., Vol. v., p. 11, February. Darling River, Australia. Figd. Amer. Journ. Conch., Vol. ii., p. 79, pl. i., fig. 8, January 1, 1866.
1865. *Paludina polita* Martens, Ann. Mag. Nat. Hist., Ser. 13, Vol. xvi., p. 256, October. Not *Vivipara polita* Frauenfeld, Verh. k.k. zool. bot. Ges. (Wien.), 1862, p. 1163. Balonne River.
1935. *Notopala gatliffi* Cotton, Vict. Naturalist, Vol. lii., p. 97, October. New name for *polita* Martens, preoccupied.

## NOTOPALA ALISONI.

1879. *Vivipara alisoni* Brazier, Proc. Linn. Soc. N.S.W., Vol. iii., p. 221 (February). Diamantina River, Queensland.

## Subgenus NOTOPALENA.

## NOTOPALA ESSINGTONENSIS.

1862. *Paludina essingtonensis* Frauenfeld, Verh. k.k. zool. bot. Ges. (Wien.), 1862, p. 1162. Port Essington.
1863. *Paludina ampullaroides* Reeve, Conch. Icon., Vol. xiv., pl. vi., sp. 1, fig. 30, February, ex Hanley MS. Hab.?
1863. *Paludina australis* Reeve, Conch. Icon., Vol. xiv., pl. xi., sp. 71, April. Victoria River, North Australia (Dring). Not *Paludina australis* Orbigny, Mag. Zool., Vol. v., 1835, 30 (C.D.S.).
1865. *Paludina affinis* Martens, Ann. Mag. Nat. Hist., Ser. 3, Vol. xvi., p. 256, October 1. Fitzroy River and near Port Essington, North Australia. Not *Paludina affinis* Marcel de S., Journ. Phys., Vol. 87, 1818, p. 162 (C.D.S.).
1866. *Vivipara suprafasciata* Tryon, Amer. Journ. Conch., Vol. ii., p. 8, pl. ii., fig. 7, January 1. Tropical Australia.

## NOTOPALA WATERHUSII.

1864. *Vivipara waterhousii* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 414, April 20, 1864. Newcastle Waters, Arnheim's Land, North Australia. Figd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 261, pl. vii., fig. 14, 1882.

## NOTOPALA BARRETTI.

1935. *Notopala barretti* Cotton, Vict. Naturalist, Vol. lii., p. 97, fig. 5, October. Innamincka, Cooper's Creek. South Australia. Figd. Sanger, American Naturalist, Vol. xvii., p. 1184, November, 1883, in text.

## NOTOPALA KINGI.

1864. *Vivipara kingi* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p.

415, April 20, 1864. King's Ponds, Arnheim's Land. Figd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 264, pl. viii., fig. 15, 1832.

## NOTOPALA TRICINCTA.

1882. *Vivipara tricincta* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 265, pl. vii., fig. 16, April 6. North Australia (J. R. Elsey).

## NOTOPALA DIMIDIATA.

1882. *Vivipara dimidiata* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 265, pl. vii., fig. 17, April 6. Victoria River, North Australia (J. R. Elsey).

Probably these last three are based on normal variations only.

## Genus CENTRAPALA.

1935. *Centrapala* Cotton, Rec. South Austr. Mus., Vol. v., p. 343, September 30. Orthotype, *Paludina lirata* Tate.

## CENTRAPALA LIRATA.

1887. *Paludina lirata* Tate, Trans. Roy. Soc. South Aust., Vol. ix., p. 63, pl. iv., figs. 6 a-b, March (Seps. issued December 29, 1886). Cooper's Creek, Innamincka, Central Australia. Refigd. Cotton, at reference given above for *Centrapala*, figs. 19-20 in text.

## Genus LARINA.

1855. *Larina* A. Adams, Proc. Zool. Soc. (Lond.), 1854, p. 41, January 10, 1855. Haplotype, *L. strangei* A. Adams. Not. *Larinus* Germar, Ins. spec. novae, I. 379, 1824 (Neave).

## LARINA STRANGEI.

1855. *Larina strangei* A. Adams, Proc. Zool. Soc. (Lond.), 1854, p. 41, pl. xxvii., fig. 3, January 10, 1855. Moreton Bay, Queensland.

Probably the genus *Larina* should be renamed *Eularina* nov., but *Robinsonia* Neville, 1870, is undoubtedly invalidated by Grote, 1865 (Neave), and should be renamed, if this has not already taken place. Many years I wrote *Neclarina* in place, and perhaps this may come into use.

## Family PALUDESTRIDAE.

Comparatively recently, Thiele investigated some of these small fresh water molluscan forms, and built up a somewhat complex arrangement of families, subfamilies and "tribes." The "tribes" covered sufficiently distinct groups to be used in a more accurate grouping as families, but their limits seem too lax to be natural. From examination of the multitude of Australian and Tasmanian forms, it has been concluded that the only course for safety in determination is to use the smallest limits. It is well known that these fresh water molluscs show variation according to conditions, such as fast or slow water, acid or alkaline, about which we have, as yet, little data. Unfortunately this variation has been utilised to class together unrelated forms, and the tangle is not easy to unravel. The present account is merely an attempt to provide a basis for future work. Some of these small molluscs have been accused of carrying diseases, such as Schistosomiasis, and Sheep Fluke disease, but none of the many Australian forms has yet been accused. The reversion to *Bythinella* by Gabriel for our shells classed as *Potamopyrgus* is inexplicable, especially as Thiele has placed

these two genera in different groups. There can be no doubt that if our shells are not classed under *Potamopyrgus*, they must be placed in a new genus very closely allied, but not by any means can they be transferred to *Bythinella* or its vicinity.

Genus POTAMOPYRGUS.

1865. *Potamopyrgus* Stimpson, Amer. Journ. Conch., Vol. i., p. 53, February 15. Orthotype, *Amnicola corolla* Gould (New Zealand).  
 1891. *Huttonia* Johnston, Proc. Roy. Soc. Tasm., 1890, p. 90. New name for *Potamopyrgus* Hutton = Stimpson. Not *Huttonia* Cambridge, 1880, nor Kirk, 1882.

POTAMOPYRGUS NIGER.

1834. *Paludina nigra* Quoy & Gaimard, Voy. de l'Astrol. Zool., Vol. iii., p. 74, pl. 58, figs. 9-12. D'Entrecasteaux Channel, Tasmania.  
 1872. *Paludestrina legrandiana* Brazier, Proc. Zool. Soc. (Lond.), 1871, p. 698, May 2, 1872. New Norfolk, Tasmania. Figd. May, Papers Proc. Roy. Soc. Tasm., 1920, pl. xi., fig. 23.  
 1872. *Paludestrina wisemaniana* Brazier, Proc. Zool. Soc. (Lond.), 1871, p. 699, May 2, 1872. Hobart Town, Tasmania.  
 1876. *Bythinia unicarinata* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 76, March 21, 1876. Salmon Ponds, South Tasmania. Figd. May, loc. cit., p. 72, pl. xi., fig. 25.  
 1876. *Bythinia tasmanica* Ten.-Woods, loc. cit., p. 76, March 21, 1876. Tasmania. Figd. May, loc. cit., p. 72, pl. xi., fig. 26.

POTAMOPYRGUS PETTERDIANUS.

1875. *Amnicola petterdiana* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 19, April 27. Scottsdale, North Tasmania.

POTAMOPYRGUS LEGRANDI.

1876. *Bythinia legrandi* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 76, March 21, 1876. Brown's River, South Tasmania.  
 1879. *Bythinella exigua* Ten.-Woods, loc. cit., 1878, p. 71, February 24, 1879. New name for *legrandi* (the smallest Tasmanian species, 2 mm. x 1 mm.) on account of prior *legrandiana* Brazier. Not figured by May, Papers Proc. Roy. Soc. Tasm., 1920, pl. xi., fig. 24 (supposed type).

POTAMOPYRGUS BUCCINOIDES.

1834. *Paludina buccinoides* Quoy & Gaimard, Voy. de l'Astrol. Zool., Vol. iii., p. 175, pl. 58, figs. 13-15. Western Port, Victoria.  
 1878. *Bythinia victoriae* Tenison-Woods, Trans. Roy. Soc. Victoria, Vol. xiv., p. 65, March 14. Lake Connewarre. Figd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 270, pl. vii., fig. 20, 1882.

Genus RIVISESSOR, nov.

Type, *Hydrobia gunnii* Frauenfeld (auct.).

Differs from the preceding in form, in the operculum, and in minute details of the radula. If *Potamopyrgus* be not used, this name will be available, but this course is not recommended.

## RIVISESSOR GUNNII.

1863. *Hydrobia gunnii* Frauenfeld, Verh. zool.-bot. Gesell. Wien., Vol. xiii., p. 1025. New Holland = Tasmania ex R. Gunn. Figd. id. ib., Vol. xv., p. 526, pl. 7, figs. —, 1865. Refigd. Hedley, Proc. Linn. Soc. N.S.W., 1913, p. 283, pl. 17, fig. 51.
1875. *Amnicola simsoniana* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 19, April 27. Brighton, Hobart (A. Simson). Figd. Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 72, pl. ii., fig. 5, 1889.
1876. *Bythinia pontvillensis* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 76, March 21, 1876. Brighton, Tasmania (A. Simson). Figd. May, loc. cit., 1920, p. 71, pl. xi., fig. 19.

## RIVISESSOR TURBINATUS.

1889. *Hydrobia turbinata* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 77, pl. ii., fig. 3. River Styx, east coast Tasmania. Figd. May, loc. cit., 1920, pl. xii., fig. 30.

## RIVISESSOR TASMANICUS.

1858. *Hydrobia tasmanica* Martens, Arch. Nat. (Wiegmann), Vol. 24, pt. i., p. 85, pl. v., fig. 12. Tasmania.
1865. *Amnicola diemense* Frauenfeld, Verh. Zool. Bot. Ges. Wien., Vol. xv., p. 529, pl. x., two figs. No locality = Tasmania.
1876. *Bythinia dulvertonensis* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 77, March 21, 1876. Lake Dulverton, Tasmania. Figd. Petterd, loc. cit., 1888, p. 71, pl. i., fig. 12, 1889. Refigd. May, loc. cit., 1920, p. 72, pl. xii., fig. 28.
1889. *Potamopyrgus woodsii* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 71, pl. i., fig. 12. South Esk River, N. Tasmania.

## RIVISESSOR BROWNII.

1889. *Potamopyrgus brownii* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 72, pl. iii., fig. 14. St. Paul's River, north coast Tasmania. Figd. May, loc. cit., 1920, p. 71, pl. x., fig. 17.

## RIVISESSOR PATTISONI.

1942. *Bythinella pattisoni* Cotton, Trans. Roy. Soc. South Austr., Vol. 66, p. 81, "fig. 1" = pl. i., figs. 5, 6, 7, July 31. River Torrens, South Australia.

## Genus PUIPIHRYX, nov.

Type, *Bithynia dyeriana* Petterd.

The species of this group differ from the preceding in their smaller size, pupoid form, with the operculum paucispiral, the nucleus somewhat distant from the edge, not like that of *Potamopyrgus*.

## PUIPIHRYX DYERIANA.

1879. *Bithynia dyeriana* Petterd, Journ. Conch. (Leeds), Vol. ii., p. 86, March. Long Bay, North Tasmania. Figd. May, Papers Proc. Roy. Soc. Tasm., 1920, p. 71, pl. x., fig. 18.

## PUIPIHRYX SMITHII.

1889. *Potamopyrgus smithii* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p.

72, pl. i., fig. 10. Heazlewood River, N.W. Tasmania. Figd. May, loc. cit., p. 72, pl. xi., fig. 27.

PUPIPHRYX ELONGATA.

1920. *Potamopyrgus elongatus* May, Papers Proc. Roy. Soc. Tasm., 1920, p. 72, pl. xi., fig. 21, September 14. Apsley River, near Bicheno, east coast Tasmania.

PUPIPHRYX DUNROBINENSIS.

1876. *Bythinia dunrobinensis* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, fig. 77, March 21, 1876. Dunrobin, Ouse, Tasmania. Figd. May, loc. cit., p. 71, pl. xi., fig. 20.

PUPIPHRYX GRAMPIANENSIS.

1939. *Bythinella grampianensis* Gabriel, Mem. Nat. Mus. Melb., No. 11, p. 106, pl. i., fig. 5, November. Near Silver Band Falls, Grampians, Victoria.

PUPIPHRYX COOMA, *sp. nov.*

This shell is small, about  $4\frac{1}{2}$  whorls, regularly pupoid, mouth free, minute umbilical chink, pale brown, sutures impressed, whorls rounded, mouth oval, 2.5 mm. in length by 1.5 mm. in breadth. From Cooma, southern N.S.W. The first *Pupiphryx* from N.S.W.

Genus PHRANTELA, *nov.*

Type, *Potamopyrgus* (?) *marginata* Petterd.

Shell white, sutures margined, spire somewhat awl-shaped, recalls *Tatea* more than any other group, but nothing much like that, and may even not belong to this family.

PHRANTELA MARGINATA.

1889. *Potamopyrgus* (?) *marginata* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 73, pl. i., fig. 9. Heazlewood River, North-west Tasmania. Figd. May, loc. cit., 1920, p. 72, pl. xi., fig. 22.

Genus PETTERDIANA.

1895. *Petterdiana* Brazier, Papers Proc. Roy. Soc. Tasm., 1894-95, p. 105, August, 1896. New name for *Brazieria* Petterd. Orthotype, *Ampullaria tasmanica* Ten.-Woods.
1889. *Brazieria* Petterd, Papers Proc. Roy. Soc. Tasm., 188, p. 76. Haplotype, *Ampullaria tasmanica* Ten.-Woods. Not *Brazieria* Ancey, 1887.
1898. *Pseudampullaria* Ancey, Ann. Mus. d'Hist. Nat. Marseille, Vol. i., p. 148. New name for preceding.
1900. *Petterdiella* Pilsbry, Nautilus, Vol. xiii., p. 144, April. Error only for *Petterdiana*.

PETTERDIANA PALUDINELLA.

1857. *Littorina paludinella* Reeve, Conch. Icon., Vol. x., pl. xvi., sp. 84. Tasmania. Cf. Hedley, Proc. Linn. Soc. N.S.W., Vol. xxxviii., p. 283, 1913.

1877. *Ampullaria tasmanica* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1876, p. 117, February 27, 1877. Tasmania, probably = Arthur River, etc. North Coast. Figd. Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 76, pl. i., fig. 8. Refgd. May, id. ib., 1920, p. 73, pl. xii., fig. 35.

Genus BEDDOMENA, *nov.*

Type, *Beddomeia bellii* Petterd.

This name is introduced for the smaller perforate shells formerly in-

cluded in *Petterdiana*, which is a heavy imperforate shell; these are conical with rounded whorls, oval free mouth, spire as long as mouth, and operculum paucispiral.

BEDDOMENA BELLII.

1889. *Beddomeia bellii* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 75, pl. i., fig. 7. Heazlewood River, North-west Tasmania. Refigd. May, Papers Proc. Roy. Soc. Tasm., 1920, p. 73, pl. xii., fig. 31, September 14.

BEDDOMENA LODDERAE.

1889. *Beddomeia lodderae* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 75, pl. iii., fig. 1. Castra River, North Tasmania. Refigd. May, loc. cit., 1920, p. 73, pl. xii., fig. 34.

BEDDOMENA HULLII.

1889. *Beddomeia hullii* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 75, pl. i., fig. 8. Heazlewood River, N.W. Tasmania. Refigd. May, loc. cit., 1920, p. 73, pl. xii., fig. 32.

Genus TASMANIELLA.

1898. *Tasmaniella* Ancey, Ann. Mus. d'Hist. Nat. Marseille, Vol. i., p. 148. New name for  
1889. *Beddomeia* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 73. Type, *Amnicola launcestonensis* Johnston. Not *Beddomea* Nevill, 1878 (Neave).

TASMANIELLA LAUNCESTONENSIS.

1879. *Amnicola launcestonensis* Johnston, Papers Proc. Roy. Soc. Tasm., 1878, p. 24, February 24, 1879. South Esk, North Tasmania. Figd. Petterd, loc. cit., 1888, p. 74, pl. i., fig. 2. Refigd. May, id. ib., 1920, p. 73, pl. xii., fig. 33.

TASMANIELLA TUMIDA.

1889. *Beddomeia launcestonensis* var. *tumida* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 74, pl. iii., fig. 11. The Great Lake, mid-Tasmania.

TASMANIELLA MINIMA.

1889. *Beddomeia launcestonensis* var. *minima* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 74, pl. i., fig. 3. Scottsdale, North Tasmania.

Genus VALVATASMA, nov.

Type, *Valvata tasmanica* Ten.-Woods.

The short spire, globose form and open umbilicus separate this at sight from any of the preceding, with which it has been associated through lack of a satisfactory location.

VALVATASMA TASMANICA.

1876. *Valvata tasmanica* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 82, add. note, March 21, 1876. Gould's County, North East Tasmania. Figd. Petterd, loc. cit., 1888, p. 75, pl. i., fig. 11. Refigd. May, id. ib., 1920, p. 73, pl. xii., fig. 36.

Genus JARDINELLA.

1938. *Jardinella* Iredale & Whitley, South Austr. Nat., Vol. xviii., p. 67, April 30. Orthotype, *Petterdiana thaanumi* Pilsbry.

This perforate shell is quite unlike the type of *Petterdiana*, and may have little relationship with any of the Tasmanian molluscs.

## JARDINELLA THAANUMI.

1900. *Petterdiana thaanumi* Pilsbry, Nautilus, Vol. xiii., p. 144, April. Near Cairns, N. Queensland. Figd. Hedley, Proc. Linn. Soc. N.S.W., 1900, p. 727, pl. xlviii., fig. 11, May 20, 1901.

## Genus POSTICOBIA, nov.

Type, *Hydrobia brazieri* Smith.

This cannot be placed in any genus on account of its form, strong peripheral keel and almost free oval mouth. The operculum is horny, paucispiral, the nucleus somewhat distant from the edge, and rather loosely wound.

## POSTICOBIA BRAZIERI.

1882. *Hydrobia brazieri* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 269, pl. vii., fig. 21, April 6. South Grafton, Clarence River, New South Wales.
1884. *Amnicola positura* Petterd, Journ. Conch. (Leeds), Vol. iv., p. 159, January. Richmond River, New South Wales.
1889. *Amnicola carinata* Brazier, Journ. Conch. (Leeds), Vol. vi., p. 72, May 4. As synonym of preceding.

Many specimens from the Chichester Dam, Hunter River district, agree generally, but the keel is not pronounced on the last whorl. The shell is smaller, rarely exceeding 2 mm. in height, and nearly 2 mm. in breadth, and distinctly perforate. This may be called *P. chena* sp. nov.

## Genus FLUIDONA.

1937. *Fluidona* Iredale, Austr. Zool., Vol. viii., p. 306, March 12. Haplo-type, *Hydrobia petterdi* Smith.

## FLUIDONA PETTERDI.

1882. *Hydrobia petterdi* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 270, pl. vii., fig. 23, April 6. (Not July, 1881, as given in Austr. Zool. above cited.) Richmond River, New South Wales.
1884. *Bithynia richmondiana* Petterd, Journ. Conch. (Lond.), Vol. iv., p. 159, January. Richmond River, N.S.W. Figd. Hedley, P.L.S.N.S.W., 1904, pl. viii., fig. 7.
1892. *Pupa anodonta* Hedley and Musson, Proc. Linn. Soc. N.S.W., Ser. 2, Vol. vi., p. 588, fig. in text, May 23. North Pine River, South Queensland.

## Genus ANGROBIA, nov.

Type, *Hydrobia angasi* Smith.

Although Smith pointed out the peculiarities of this form, calling attention to the "clawed" operculum, a distinctive feature and foreign to *Bythinella*, Gabriel has even made the species a synonym of *buccinoides*, which he placed in *Bythinella*. Cotton has recently figured the operculum of his *Bythinella pattisoni*, which disagrees with this.

## ANGROBIA ANGASI.

1882. *Hydrobia angasi* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 271, pl. vii., fig. 22, April 6. Compasely River, Victoria.

## Genus TATEA.

1879. *Tatea* Tenison-Woods, Papers Proc. Roy. Soc. Tasm., 1878, p. 72, February 24, 1879. Haplotype, *Bythinia huonensis* Ten.-Woods.

## TATEA HUONENSIS.

1876. *Bythinia huonensis* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 71, March 21. Huon River, South Tasmania. Figd. May, Illus. Index Tasm. Shells, pl. xxv., fig. 26, 1923.

## TATEA RUFILABRIS.

1862. *Diala rufilabris* A. Adams, Ann. Mag. Nat. Hist., Ser. 3, Vol. x., p. 298, Oct. Port Lincoln, South Australia. Figd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 268, pl. vii., fig. 19, 1882. Refigd. Cotton, Trans. Roy. Soc. South Austr., Vol. 66, p. 81, pl. i., figs. 1, 2, 3, 4, 1942.

## TATEA PARADISIACA.

1897. *Tatea paradisiaca* Pilsbry, Proc. Acad. Nat. Sci. Philad., 1897, p. 362, pl. ix., figs. 10-11, November 23. Eden, Twofold Bay, N.S.W.

TATEA KESTEVENI, *sp. nov.*

With Dr. H. L. Kesteven I collected numerous examples in the Myall Lakes of a very distinct species of *Tatea*. I have since found it in the Manly Lagoon, and herewith name it. It is much more slender than any other species, reaching over 5 mm. in length with only 1.5 mm. at broadest part, the spire attenuate, the whorls numbering at least eight, the colour brown, mouth complete, lip thickened, but not varicose. (Manly, N.S.W.)

TATEA BALLINA, *sp. nov.*

Here the species has reverted to a thick shell recalling *rufilabris*, but not as broad as *paradisiaca*. The shell has six whorls, the last whorl broad, the others rapidly narrowing, but nothing like the preceding. The shell measures 4.5 in length and 2 mm. in breadth. The outer surface of the operculum shows the nucleus more central than in the type with strong radiating growth lines. The type is from Ballina, northern New South Wales, and the species occurs on Stradbroke Island, South Queensland.

## TATEA PREISSII.

1846. *Paludina preissii* Philippi, Abbild. Conch., Vol. ii., p. 137, pl. ii., fig. 12, October. (= *Paludina acuta* Menke, not Say). West Australia.

## Family STENOXYRIDAE.

Genus OBESITENA, *nov.*

Type, *Stenothyra australis* Hedley.

While the shell recalls *Stenothyra* it differs in its operculum, which is horny, not calcareous, paucispiral, with nucleus subcentral.

## OBESITENA AUSTRALIS.

1901. *Stenothyra australis* Hedley, Proc. Linn. Soc. N.S.W., 1900, p. 724, pl. xlvi., fig. 10, May 20. Bowen, Queensland.

A large series from Nudgee, near Brisbane, shows the operculum fitting the mouth, as above, shell slightly narrower, spire a little longer, imperforate, and may be named *O. a. wildiana* subsp. nov. Another series picked

out of shell sand from Darwin, Northern Territory, shows a smaller, fatter shell, also imperforate, and this may be called *O. a. perdives* subsp. nov.

Family IRAVADIIDAE.

Genus PELLAMORA, nov.

Type, *Iravadia australis* Hedley.

Hedley described this species "from fresh water," without comparison with specimens of the Indian *Iravadia*. I cannot see any close relationship, but am leaving it in the family meanwhile. The shells are subcylindrical, spirally lirate, rounded whorls, aperture entire, outer lip varicose. Dead shells of more than one species are before me, and they are always recognisable by their translucent appearance. The apex is smooth and planate variced.

PELLAMORA AUSTRALIS.

1901. *Iravadia australis* Hedley, Proc. Linn. Soc. N.S.W., 1900, p. 727, pl. xlviii., fig. 12, May 20. "Fresh water," Bowen, Queensland.

PELLAMORA PROCERA, sp. nov.

Shell much larger, more elongate, imperforate, dead shell white, whorls four and a half, decollate, last whorl with eight strong lirae, longitudinal striae between, which do not bead the lirae. Length, 7 mm.; breadth, 3 mm. Almost a miniature is a small shell, measuring 2.5 mm. by 1.25 mm., sculpture and form similar, four adult whorls, a one and a half smooth planate protoconch, which may be called *P. laseroni*, after Cpl. J. Laseron, who collected the shell sand at Port Darwin from which these two species were picked out.

Family BITHYNIIDAE.

Genus GABBIA.

1865. *Gabbia* Tryon, Amer. Journ. Conch., Vol. i., p. 220, July 1. Haplotype, *G. australis* Tryon.

GABBIA AUSTRALIS.

1865. *Gabbia australis* Tryon, Amer. Journ. Conch., Vol. i., p. 220, pl. xxii., fig. 7, July 1. New South Wales.  
1875. *Bithinia hyalina* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 9, April 27. Eastern Creek (Sydney), New South Wales.

GABBIA AFFINIS.

1882. *Bithinia affinis* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 267, ex Brazier MS., April 6. Burdekin River, North Queensland.

GABBIA CENTRALIA, sp. nov.

1896. *Bithinia australis* Tate, Rep. Horn. Sci. Exped., pt. ii., Zool., p. 210, February. Oodnadatta, Central Australia.  
1896. *Bithinia australis* Hedley, id. ib., p. 220, figs. A.-B. in text.  
As pointed out by Tate, the Centralian shell is larger.

GABBIA SMITHII.

1882. *Bithinia australis* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 267, pl. vii., fig. 18, April 6. Victoria River, North Australia.

1882. *Bithinia smithii* Tate, Trans. Roy. Soc. South Austr., Vol. v., p. 54, December. New name for *B. australis* Smith, not Tate & Brazier, 1881.
1887. *Bithinia tryoni* Smith, Journ. Conch. (Leeds), Vol. v., p. 236, November 12. New name for *B. australis* Smith.

## Genus HYDROCOCCLUS.

1928. *Hydrococcus* Thiele, Zool. Jahrb. (Jena), Syst. Bd. 55, p. 375, September 12. Haplotype, *H. graniformis* Thiele.

## HYDROCOCCLUS GRANIFORMIS.

1928. *Hydrococcus graniformis* Thiele, Zool. Jahrb. (Jena), Syst. Bd. 55, p. 375, fig. 30, September 12. West Australia. New name for
1843. *Paludina granum* Menke, Moll. Nov. Holl. Spec., p. 8, April 11. Banks of the Swan River, West Australia. Not *Paludina grana* Say, 1822 (Sherborn).

## Family THIARIDAE.

This family includes the species formerly known as *Melania*, and it is here emphasised that *Oncomelania*, the mollusc accused in Japan of carrying Schistosomiasis, does not belong here.

## Genus THIARA.

1798. *Thiara* Bolten, Mus. Bolten, pt. ii., p. 109, September. Haplotype, *Helix amarula* Linné.
1799. *Melania* Lamarck, Mem. Soc. d'Hist. Nat. (Paris), p. 75, May. Haplotype, *Helix amarula* Linné.

*Melacantha* Swainson, *Amarula* Sowerby, etc., are other synonyms.

## THIARA AMARULOIDEA, sp. nov.

Shells from Cardwell, Queensland, were referred to the type of *Thiara amarula* Linné, a name used to cover most of the Indo-Pacific forms of *Thiara*. Smith observed that the local shell approximated to *cybele* Gould, from the Fijis, whose tubercles are "less numerous, sharper and longer" than those of the Amboina type. On the other hand, the Cardwell species, measuring 46 mm. by 28 mm., with two whorls remaining shows twenty or more short spines on the shoulder of the last whorl, and about fourteen on the preceding one.

## Genus PLOTIOPSIS.

1874. *Plotiopsis* Brot., Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xxiv., p. 7. Orthotype, *Melania balonnensis* Conrad.

## PLOTIOPSIS BALONNENSIS.

1850. *Melania balonnensis* Conrad, Proc. Acad. Nat. Sci. Philad., Vol. vi., p. 11, February. Balonne River, Australia. Figd. Am. Journ. Conch., Vol. ii., p. 80, pl. i., fig. 10, January 1, 1866.
1878. *Melania oncooides* Ten.-Woods, Proc. Linn. Soc. N.S.W., Vol. iii., p. 5, September. Bourke, River Darling, New South Wales.

## PLOTIOPSIS TETRICA.

1850. *Melania tetrica* Conrad, Proc. Acad. Nat. Sci. Philad., Vol. v., p. 11, February. Rivers of South-east Australia = Murray River. Figd. Amer. Journ. Conch., Vol. ii., p. 80, pl. i., fig. 9, January 1, 1866.

1881. *Melania tatei* Brazier, Proc. Linn. Soc. N.S.W., Vol. vi., p. 551, December. New name only for *M. tetrica* Conrad.
1882. *Melania subsimilis* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 262, pl. v., fig. 13, April 6. Australia, J. Gould = Lower Murray River, South Australia, fide Cotton.

## PLOTIOPSIS INCERTA.

1862. *Melania incerta* Brot, Matériaux fam. Melan., I., p. 52. New name for
1843. *Melania lirata* Menke, Moll. Nov. Holl. Spec., p. 9, April 11. Avon River, District York, Western Australia. Figd. Brot., Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. 24, p. 287, pl. 28, fig. 15, 1877.

## PLOTIOPSIS AUSTRALIS.

1857. *Melania australis* Lea (Isaac & Henry), Proc. Zool. Soc. (Lond.), 1850, pl. 85, February 28, 1851. Victoria River, North Australia. Figd. Reeve, Conch. Icon., Vol. xii., pl. xiii., fig. 82, December, 1859.
1860. *Melania cerea* Brot., Revue Zool., 1860, p. 266, pl. 17, fig. 13, July. Hab. unknown.
1862. *Melania decussata* Brot, Matériaux fam. Melan., I., p. 55. New name for *M. australis* Lea.

PLOTIOPSIS SUBORNATA, *sp. nov.*

The coastal Queensland shell recalls the description of *subsimilis* Smith, being brightly coloured and generally of a smoother appearance, but it is larger and broader, up to 34 mm. by 14 mm. wide, and with more numerous longitudinals, the type coming from the Burdekin River, North Queensland.

Genus SERMYLASMA, *nov.*

Type, *Melania venustula* Brot.

This group is well characterised by the short form, longitudinal sculpture, with lirate base, mouth oval, anteriorly base almost canaliculate, outer lip thin.

## SERMYLASMA VENUSTULA.

1877. *Melania venustula* Brot, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. 23, p. 331, pl. xxxiv., figs. 5-5a. Port Denison, Queensland.

SERMYLASMA PROGATA, *nom. nov.*

1882. *Melania venustula* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 260, pl. v., fig. 10, April 6. Victoria River, North Australia (Elsey). Not of Brot as above.

SERMYLASMA RETRACTA, *sp. nov.*

Specimens from Lennard River, North-west Australia, are small, only 6 mm. long by 4 mm. broad, four whorls remaining, longitudinal ribs few, ten on last whorl, over-run by spiral lirae, basal lirae few and strong, and pale brown in colour, mouth subcanaliculate anteriorly.

## SERMYLASMA ELSEYI.

1882. *Melania elseyi* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 261, pl. v., fig. 12, April. Australia (J. R. Elsey).

## SERMYLASMA ONCA.

1864. *Melania (Melasma) onca* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 415, April 20, 1864. Adelaide River, Arnheim's Land. Figd. Brot, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xxiv., p. 330, pl. xxxiv., fig. 7, 1877.

## SERMYLASMA CARBONATA.

1859. *Melania carbonata* Reeve, Conch. Icon., Vol. xii., pl. xiii., fig. 88, December. No locality. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 259, 1882, gives "Port Essington (J. B. Jukes and Gould)."

## Genus STENOMELANIA.

1885. *Stenomelania* Fischer, Man. Conch., livr. viii., 701, January 29. Haplo-type, *Melania aspirans* Hinds.

## STENOMELANIA DENISONIENSIS.

1877. *Melania denisoniensis* Brot, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. 23, p. 234, pl. xxv., figs. 6 a-b. Port Denison, Queensland. Figd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 259, pl. v., figs. 4-8, 1882.

Smith's figures, given to show variation, were from various localities, and specimens from the Clarence River, N.S.W., are not so convex as the type, broader, larger, and may be subspecifically separated as *S. d. ultra* subsp. nov. On the other hand, Cardwell and further north the shells are tabulate, and agree with Smith's figure 5, and may be called *S. d. tacita* subsp. nov.

## Genus RIPALANIA, nov.

Characterised by its smoothness, short, stout shape, recalling *Melanopsis*, but long oval mouth, nearly as long as decollated spire, is not canalliculate.

## RIPALANIA QUEENSLANDICA.

1882. *Melania queenslandica* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 261, pl. v., fig. 11, April 6. Saltwater Creek, Cardwell, North Queensland.

## Genus PSEUDOPOTAMIS.

1894. *Pseudopotamis* Martens, Denkschr. Ges. Jena, Vol. viii. (Zool. Forsch, Austr. (Semon), Band v., Moll.), p. 86, ex Brot MS. Type (here designated) *P. finschi* Martens.

## PSEUDOPOTAMIS SUPRALIRATA.

1887. *Melania supralirata* Smith, Journ. Conch. (Leeds), Vol. v., p. 237, November 12. Prince of Wales Island, Torres Strait.
1894. *Pseudopotamis finschi* Martens, loc. cit., p. 87, pl. iv., fig. 4. Prince of Wales Island, Torres Strait.

## PSEUDOPOTAMIS SEMONI.

1894. *Pseudopotamis semoni* Martens, Denkschr. Ges. Jena, Vol. viii., p. 87, pl. iv., fig. 6. Hammond Island, Torres Strait.

## Family COXIPELLIDAE.

The curious shells here placed have been referred to the neighbourhood

of *Truncatella* = *Acmea*, but this relationship is very obscure. Acmeid species are definitely marine, living on the coast line, whereas the Coxiellids live on the banks of salt lakes, even in the interior of Australia. The number of species is not yet known, but there may be half a dozen or more. Hedley wrote a note, "On a Thalassoid Element in the Australian Molluscan Fauna" (Vict. Naturalist, Vol. xl., pp. 75-77, August 9, 1923), drawing attention to their peculiarities, and advancing *filosa* Sowerby, 1838, as the earliest name, and also date of record of the group. But a much earlier note was from Rottneest Island, W. Australia, whence Peron records, "Bailly found two species of small shells: one a bivalve, the other a univalve, fairly similar to a *Melania* and red in colour on the shores of the salt lakes. The shores of most of these lakes were quite literally covered with these shells." Mitchell's later discovery of similar shells was on the banks of Mitre Lake, Victoria, over one hundred miles inland from the sea. It may be here noted that at first referred to *Truncatella*, it was later transferred to *Blanfordia*, then to *Pomatiopsis*, before being settled as *Coxiella*. At first glance the shells from the interior salt lakes did not belong to *Coxiella*, and *Coxiellada* was introduced, but a review of the species suggests that they do not even belong to the family, and may be more closely related to *Gabbia*, while there appears to be more species to be distinguished in many places. I note May did not include the species in his account of Tasmanian Fresh Water Mollusca, and he has been followed by Gabriel, on the grounds that they inhabit "salt water" lakes, but it seems impossible to place them amongst marine forms when they sometimes live hundreds of miles from the sea. A review of the material available indicates how much they have been misunderstood through this neglect by writers on fresh water and marine molluscs.

#### Genus COXIELLA.

1894. *Coxiella* Smith, Proc. Malac. Soc. (Lond.) ,Vol. i., p. 98, June. Haplo-type, *Truncatella striatula* Menke.

#### COXIELLA STRIATULA.

1843. *Truncatella striatula* Menke, Moll. Nov. Holl. Spec., p. 9, April. Western Australia = Rottneest Island.

#### COXIELLA PYRRHOSTOMA.

1868. *Blanfordia pyrrhostoma* Cox, Mon. Austr. Austr. Land Shells, p. 95, pl. xv., figs. 14-14c, May. Shark's Bay, Western Australia.

#### COXIELLA STRIATA.

1842. *Truncatella striata* Reeve, Conch. Syst., Vol. ii. (3), p. 94, pl. 182, fig. 4, May, ex J. Sowerby MS. No locality. Mitre Lake, Victoria.
1838. *T(runcatella) filosa* Mitchell, Three Exped. East Austr., Vol. ii., p. 190, footnote ex J. Sowerby MS. Mitre Lake, Victoria. *Nomen nudum*.
1898. *Coxiella confusa* Smith, Proc. Malac. Soc., Vol. iii., p. 76, July. Adelaide, South Australia.

#### COXIELLA BADGERENSIS.

1879. *Pomatiopsis badgerensis* Johnston, Papers Proc. Roy. Soc. Tasm., 1878, p. 26, February 24, 1879. Fossil, Badger Island, Bass Strait. Figd. as recent species, May, Illus. Index Tasm. Shells, pl. xxvi., fig. 12, 1923.

Similar shells occur in Gippsland and Stawell, Victoria, but a series

from Port Phillip, Victoria, shows a very different form, the shell being long, narrow, the whorls flattened, six to ten whorls, measuring 8 mm. in length with only 2-2.5 mm. in breadth, the mouth not free, imperforate, operculum paucispiral. This may be called *Coxiella molesta* sp. nov. Another series from Port Fairy, Victoria, is comprised of shells with only five very rounded whorls, mouth free, umbilical chink present, different darker coloration, and measuring 9 mm. by 4 mm. This should be *confusa* or *striata*, if these be different as series here suggests.

#### Genus COXIELLADDA.

1938. *Coxielladda* Iredale & Whitley, South Austr. Nat., Vol. xviii., p. 66, April 30, 1938. Orthotype, *Paludinella gilesi* Angas.

This genus should be transferred to the neighbourhood of *Gabbia*, even as Tate recognised. The shell is not truly decollate, only the tip eroded, while the whorls are few in number, rounded, the shell perforate, the operculum paucispiral, with the nucleus subcentral, and increasing concentrically. The coloration is also different from that of the *Coxiella* series.

#### COXIELLADDA GILESI.

1877. *Paludinella gilesi* Angas, Proc. Zool. Soc. (Lond.), 1877, p. 70, pl. xxvi., fig. 2. Shore of Lake Eyre, South Australia.

1894. *Blandfordia stirlingi* Tate, Trans. Roy. Soc. South Austr., Vol. xviii., p. 196, November. Lake Callabonna, South Australia (subfossil).

#### COXIELLADDA MAMMILLATA.

1894. *Blandfordia stirlingi* var. *mammillata* Tate, Trans. Roy. Soc. South Austr., Vol. xviii., p. 196, November. Murchison Goldfield, Western Australia.

This small squat shell of only three whorls is very unlike a *Coxiella*, especially as the apex is not truncate, but mammillate and persistent; operculum as in the preceding.

#### COXIELLADDA EXPOSITA, sp. nov.

A large number of shells collected by Mr. E. Le G. Troughton at Cranbrook inland from Albany, W.A., consisted of two species, one a *Coxiella* similar to that collected at Rottnest Island by Mr. G. P. Whitley. The other was easily separated by its more rounded whorls, darker coloration and the presence of an operculum filling the aperture. The shell normally measured 6 mm. long by 3.25 mm. wide, the largest about 8 mm., three rounded whorls remaining, dark blackish brown, concentric striation, mouth oval, practically free, lip solid, three apical whorls sometimes present. The operculum was paucispiral, but with age it appeared concentric through the increase being all round, instead of one side only, as in normal paucispiral opercula.

#### Family LYMNAEIDAE.

Although our species have commonly been referred to *Lymnaea*, that generic name has now been restricted to European species of *stagnalis* alliance, and none of our shells recalls this. The most noticeable group in Australia, and, be it noted, it does not occur in Tasmania, is that known under the name *Limnaea lessoni*, but which is a composite of many species. It is a thin, very globose, short spired shell, with the columella very strongly folded and is here named *Pepimnea*.

Genus PEPLIMNEA, *nov.*Type, *Limnea lessoni* Deshayes.

## PEPLIMNEA LESSONI.

1830. *Limnea lessoni* Deshayes, Mag. de Zool., 1830, 2 livr., pl. 16, figs. 1-2, dated June. New Holland (ex Lesson).
1831. *Lymnea lessonii* Lesson, Voy. Coquille, Zool., Vol. ii., pt. i., p. 330. River Macquarie at Bathurst, N.S.W.
1831. *Lymnaea lessonii* Lesson, Cent. Zool., pl. xlv.
1872. *Limnaea globosa* Sowerby, Conch. Icon. (Reeve), Vol. xviii., pl. xii., sp. 84, December. Australia.
- [1872. *Limnaea brevicauda* Sowerby, loc. cit., pl. xv., fig. 105, December. Australia; is not Australian but Indian, fide Blanford and Smith.]

## PEPLIMNEA PERLEVIS.

1850. *Amphipeplea perlevis* Conrad, Proc. Acad. Nat. Sci. Philad., Vol. v., p. 11, February. Salamanca and Balonne Rivers, N.S.W. Figd. Am. Journ. Conch., Vol. ii., p. 80, pl. i., fig. 5, January 1, 1866.
1872. *Limnaea cumingii* Sowerby, Conch. Icon. (Reeve), Vol. xviii., pl. vi., sp. 38, March. Australia.

## PEPLIMNEA MELBOURNENSIS.

1857. *Amphipeplea melbournensis* Pfeiffer, Novit. Conch., p. 70, pl. xix., figs. 14-15. Near Melbourne, Australia.

## PEPLIMNEA STRANGEI.

1854. *Amphipeplea strangei* Pfeiffer, Malak. Blätt., Vol. i., p. 64, dated April. Novit. Conch., Ser. i., p. 6, pl. ii., figs. 5-6, 1857. Moreton Bay, Queensland.
1886. *Amphipeplea queenslandica* Clessin, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth., xvii., p. 405, pl. 53, fig. 2. New name for
1869. *Amphipeplea involuta* (sic) Schmeltz, Mus. Godeffroy, Cat., iv., p. 81, ex Mousson MS. B. (= Brisbane) and C. = Cape York. Type locality, Brisbane, Queensland.

PEPLIMNEA LILIMERA, *sp. nov.*

The North Queensland form has the spire very short, the body globose, pale translucent, very thin, columella strongly folded. The type is from the Burdekin River, measuring 19 mm. by 15 mm., and differs at sight from Rockhampton specimens, which have a prominent spire and less globose form. Two nomina nuda may be here cited

1873. *Limnaea australiana* Paetel, Cat. Conch. Samml., p. 115, as of Cox. Queensland.
1874. *Amphipeplea acuta* Schmeltz, Mus. Godeffroy, Cat. v., p. 89, February, ex Mousson MS. Bowen.

## PEPLIMNEA VINOSA.

1864. *Amphipeplea vinosa* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 415, April 20, 1864. Adelaide River, North Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xviii., p. vi., fig. 37, March, 1872.

PEPLIMNEA VIOLENTA, *sp. nov.*

1896. *Limnaea vinosa* Tate, Rep. Horn. Sci. Exped. Centr. Austr., pt. ii., Zool., p. 211, February. Palm Creek, Darwent River, Centralia.

Differs in form, being more globose, with shorter spire, paler coloration from the northern true *vinosa*.

## PEPLIMNEA PHILLIPSI.

1864. *Amphipeplea phillipsi* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 416, April 20, 1864. Arnheim's Land. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xviii., pl. vi., fig. 41, March, 1872.
1872. *Limnaea deshayesii* Sowerby, Conch. Icon. (Reeve), Vol. xviii., pl. xiv., fig. 95, December, ex Adams MS. Australia (fide Smith, obtained in North Australia (Cornet Creek)).

## PEPLIMNEA ANGASI.

1872. *Limnaea angasi* Sowerby, Conch. Icon. (Reeve), Vol. xviii., pl. ii., fig. 12, March. Port Darwin, North Australia.

PEPLIMNEA CAURINA, *sp. nov.*

A series from the Lennard River, North-west Australia, "from lagoons," shows a thin translucent white shell, with a short acuminate spire, a very swollen body whorl, and strongly folded columella, measuring 15 mm. long by 11.5 mm. broad. Others from "water weeds in the river" itself are consistently smaller, less globose, and of a brownish colour, suggesting *vinosa*, but obviously only an ecologic variation.

## Genus AUSTROPEPLEA.

1942. *Austropeplea* Cotton, Trans. Roy. Soc. South Austr., Vol. 66, p. 80, July 31. Orthotype, *Limnaea papyracea* Tate = *aruntalis* C. & G.

## AUSTROPEPLEA ARUNTALIS.

1938. *Lymnaea aruntalis* Cotton & Godfrey, Mal. Soc. South Austr., Publ. No. 1 (Syst. List. Gastrop. S.A.), p. 36, December 31. New name for
1880. *Limnaea papyracea* Tate, Trans. Roy. Soc. South Austr., Vol. iii., p. 103, pl. iv., figs. 5a-c., December. Penola, South Australia. Not *Limnaeus papyraceus* Spix, 1827 (Sherborn).

## AUSTROPEPLEA HUONENSIS.

1876. *Limnaea huonensis* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 71, March 21, 1876. River Huon, South Tasmania. Figd. Petterd, loc. cit., 1888, p. 65, pl. 2, fig. 11.
- [1876. *Limnaea hobarttonensis* Ten.-Woods, loc. cit. Hobarton, Tasmania. Later referred to European *L. peregra*.]

## AUSTROPEPLEA LAUNCESTONENSIS.

1876. *Limnaea launcestonensis* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 71, March 21, 1876. Launceston, North Tasmania.

Genus SIMLIMNEA, *nov.*

Type, *Limnaea brazieri* Smith.

A generic name is necessary for the series of small Limnaeids very

different from the preceding. The spire is short, acute, the body whorl large, but normal, not swollen, the columella not much folded, and inner lip notable, shell comparatively stout.

## SIMLIMNEA BRAZIERI.

1882. *Limnaea brazieri* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 274, pl. v., fig. 15, April 6. Glebe Point, Sydney, N.S.W.

## SIMLIMNEA GUNNII.

1889. *Limnoea gunnii* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 66, pl. 2, fig. 10, pl. 3, figs. 9-12. South Esk River, North Tasmania.

## SIMLIMNEA VICTORIAE.

1882. *Limnaea victoriae* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 274, pl. v., fig. 16, April 6. Bairnsdale, Victoria.

## SIMLIMNEA SUBAQUATILIS.

1880. *Limnaea subaquatilis* Tate, Trans. Proc. Roy. Soc. South Austr., Vol. iii., p. 103, pl. iv., figs. 6a-b, December. River Torrens, Adelaide, South Australia.

## SIMLIMNEA NEGLECTA.

1889. *Limnaea subaquatilis* var. *neglecta* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 66, pl. 2, fig. 13, pl. 4, figs. 1-2. Launceston, north Tasmania.  
[1880. *Succinea johnstoni* Tate, Trans. Proc. Roy. Soc. South Austr., Vol. iii., p. 103, December, ex Petterd MS. Tasmania.]

Note: There are two names on record as MS only.

1882. *Limnaea viridula* Tate, Trans. Proc. Roy. Soc. South Austr., Vol. iv., 1881, p. 76, January, 1882. Murndul, Hamilton, Victoria.  
1896. *Limnaea venustula* Cherry, Proc. Roy. Soc. Vict., 1896, p. 183. Headwaters of the Wimmera, Victoria.

While the two following are regarded as referable to the European *L. peregra*, supposed to have been accidentally introduced.

1876. *Limnaea tasmanica* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 70, March 21, 1876. Hobart, South Tasmania.  
1889. *Limnoea lutosa* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 67, pl. ii., fig. 13. Brighton, River Jordan, Tasmania.

## GLACILIMNEA GELIDA, gen. &amp; sp. nov.

A small, thin shell from 35 ft., Blue Lake, Mount Kosciusko, N.S.W., is thus named. The shell measures 4.5 mm. in length by 3.25 mm. in breadth, the spire very short, the apex planate, the last whorl slightly shouldered, the columella scarcely folded, the shell brown, with little calcification and showing strong regular longitudinal striation.

## Family BULLINIDAE.

The economic importance of the molluscs of this family commands careful scrutiny of all the members in order that the blame may be attached to the right offender. It is unfortunate that these harmless creatures should be the carriers of parasites which cause serious trouble to mankind,

and his servants, the sheep. Unfortunately the earlier named forms are very difficult to determine as no exact locality was given. The species vary according to complex conditions not yet understood, so much so that specimens in any large series might be picked out mimicking other species. Apparently the species agree geographically, but in any locality there is ecologic variation which may vary year from year. Consequently it is impossible to determine a single specimen from unknown locality, and it would be wise to disallow all the names introduced without definite locality and thus stabilise the names to be used.

Genus LENAMERIA, *nov.*

Type, *Physa gibbosa* Gould.

These shells are sinistral, the spire generally shorter than the aperture, the columella folded, the mouth open. The radula is of the Lymneoid type, but the animal is different. On account of this character these species have been sometimes described as *Lymnaea*.

LENAMERIA GIBBOSA.

1847. *Physa gibbosa* Gould, Proc. Bost. Soc. Nat. Hist., Vol. ii., p. 214. Parramatta, New South Wales. Figd. U.S. Expl. Exped., Atlas, fig. 137, 1852.
- [1844. *Physa ludwigii* Kuster, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth., 17, p. 21, pl. 3, figs. 14-16, ex Krauss MS. New Holland.]
- [1882. *Physa grayi* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 277, pl. v., fig. 25, April 6. New name for *Physa novaehollandiae* "Gray," Animal Kingdom (Cuvier), ed. Griffith & Pidgeon, Vol. xii., Moll., pl. 27, fig. 4, dated 1833 (Index, p. 599, 1834).]

LENAMERIA RENOLA, *sp. nov.*

A series from Chichester Dam, Hunter River District, N.S.W., shows small thin sculptured shells, subshouldered as in *gibbosa*, spire short, body whorl oval, columella folded, sculptured with fine concentric striae and fine longitudinal threads. Length, 7.5 mm.; breadth, 4 mm.; length of aperture, 4.5 mm.; breadth, 3 mm.

LENAMERIA PECTOROSA.

- [1822. *Physa n. Hollandica* Bowdich, Elem. Conch., expl. to pl. vi., fig. 13 (pref. November 8, 1821). No locality save in name.]
1825. *Physa novaehollandiae* Blainville, Manual Malac., p. 450, refers to pl. xxxvii., fig. 3, issued December 28. Same figure as above.]
1826. *Physa novaehollandiae* Blainville, Dict. Sci. Nat. (Levrault), Vol. xl., p. 144, June 24 (Atlas, pl. 37, fig. 3), ex Lesson. Rivers of New Holland.
1831. *Physa novaehollandiae* Lesson, Voy. Coquille, Zool., Vol. ii., pt. i., p. 332, Atlas, pl. xvi., fig. 5. River Macquarie at Bathurst, New South Wales. ex *Physa australis* Lesson, Ann. Sci. Nat. (Paris), Ser. i., Vol. vi., p. 254, 1825, Nov. *Nomen nudum*.
- [1842. *Physa marginata* Kuster, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth. 17, p. 10, pl. 2, figs. 1-2. New Holland.]
1850. *Physa pectorosa* Conrad, Proc. Acad. Nat. Sci. Philad., Vol. v., p. 11,

- February. Bogan River, New South Wales. Figd. Amer. Journ. Conch., Vol. ii., p. 80, pl. i., fig. 6, 1866.
1882. *Physa lessoni* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 277, April 6. New name for *P. novaehollandiae* Lesson.
1886. *Physa kreftii* Clessin, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth. xvii., p. 370, pl. 54, fig. 12. Calvert's Creek, New South Wales.
1888. *Physa multistrigata* Cox, Proc. Linn. Soc. N.S.W., Ser. 2, Vol. iii., p. 1254, December. ex Tate MS. *Nomen nudum*. Narrabri, N.S.W.
1889. *Physa multistrigata* Cooke, Proc. Zool. Soc. (Lond.), 1889, p. 139 (Radula).

## LENAMERIA FUSIFORMIS.

1879. *Physa fusiformis* Nelson & Taylor, Journ. Conch. (Leeds), Vol. ii., p. 289, pl. i., fig. 9, October. Richmond River, N.S.W.

## LENAMERIA DUPLICATA.

1874. *Physa duplicata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. xii., sp. 100, November. Wide Bay, Australia.

## LENAMERIA BREVISPIRA.

1917. *Isodora gibbosa* var. *brevispira* Odhner, Kungl. Svensk. Vet. Handl., Bd. 52, No. 16, p. 96, September 19. Atherton, North Queensland.

## LENAMERIA SUBUNDATA.

1873. *Physa subundata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. viii., sp. 61, April. St. Margaret's, South Australia.
1874. *Physa pinguis* Sowerby, loc. cit., pl. xii., sp. 93, November. South Australia.
1874. *Physa bullata* Sowerby, loc. cit., pl. xii., sp. 97, November. South Australia. Not *Physa bullata* Potiez & Michaud, 1838.

## LENAMERIA TENUISTRATA.

1873. *Physa tenuistriata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. x., sp. 85, April. River Torrens, South Australia.
- [1874. *Physa puncturata* Sowerby, loc. cit., pl. xi., sp. 91, November. Australia.]
1874. *Physa texturata* Sowerby, loc. cit., pl. xii., sp. 95, November. South Australia.
1878. *Physa arachnoidea* Ten.-Woods, Trans. Roy. Soc. Vict., Vol. xiv., p. 63. Mordialloc, Victoria. Figd. Hedley, Rec. Austr. Mus., Vol. xii., p. 3, pl. ii., fig. 15, December 19, 1917 (type).
1885. *Physa smithi* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 294, pl. 42, fig. 23. Murray River, Australia.
- [1886. *Physa conica* Clessin, loc. cit., p. 360, pl. 51, fig. 3. South Australia.]
1886. *Physa waterhousei* Clessin, loc. cit., p. 361, pl. 51, fig. 6. South Australia.
1917. *Bullinus tenuistriatus* var. *confluens* Hedley, Rec. Austr. Mus., Vol. xii., p. 4, pl. i., figs. 9-10, December 19. Echuca, Victoria.

At this citation new figures are given of most of the above.

## LENAMERIA SUBACUTA.

1941. *Amerianna subacuta* Cotton & Beasley, South Austr. Naturalist, Vol. 21, p. 17. River Torrens, South Australia. Figd. Cotton, Trans. Roy. Soc. South Austr., Vol. 66, p. 77, pl. ii., figs. 3-4, 1942.

## LENAMERIA AUSTRALIANA.

1850. *Physa australiana* Conrad, Proc. Acad. Nat. Sci. Philad., Vol. 5, p. 11, February. Bogan River, New South Wales. Figd. Amer. Journ. Conch., Vol. ii., p. 81, pl. i., fig. 7, 1866.

## LENAMERIA CONCINNA.

1864. *Physa concinna* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 417, April 20, 1864. Arnheim's Land, North Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. 5, sp. 35, February, 1873. Refigd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 251, pl. vi., figs. 13-14, 1882.

## LENAMERIA OLIVACEA.

1864. *Physa olivacea* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 417, April 20, 1864. Arnheim's Land, North Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. v., sp. 34, February, 1873. Refigd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 286, pl. vi., fig. 15, 1882.

## LENAMERIA PROTEUS.

1873. *Physa proteus* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. vi., sp. 43, February. West Australia.

## LENAMERIA DISPAR.

1873. *Physa dispar* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. viii., sp. 66, April. Sydney, New South Wales.

## LENAMERIA NITIDA.

1874. *Physa nitida* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. xii., sp. 98, November. South-east Tasmania.

This is *gibbosa* May, not *gibbosa* Gould.

## LENAMERIA VANDIEMENENSIS.

1873. *Physa vandiemenensis* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. viii., sp. 57, April. Van Diemen's Land.
1879. *Physa diemenensis* Johnston, Papers Proc. Roy. Soc. Tasm., 1878, p. 21, February 24, 1879. Lapsus only.

## LENAMERIA BADIA.

1864. *Physa badia* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 416, April 20, 1864. Adelaide River, North Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. vii., fig. 51, February, 1873.

## LENAMERIA GEORGIANA.

1832. *Physa georgiana* Quoy & Gaimard, Voy. de l' Astrol., Zool., Vol. ii., p. 207, pl. lviii., figs. 23-24. King George's Sound, S.W. Australia. Copied Smith, loc. cit., p. 277, pl. v., figs. 23-24, 1882.

1844. *Physa australis* Kuster, Syst. Conch. Cab. (Mart. & Chemn.), cont., Bd. I., Abth. 17, p. 9, pl. i., figs. 15-17, ex Koch MS. (*P. elongata* Menke, 1843, p. 8, not Say). West Australia.
1882. *Physa breviculmen* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 290, pl. vi., fig. 26, April 6. King George's Sound, S.W. Australia. Refigd. Cotton, Trans. Roy. Soc. Sth. Austr., Vol. 66, pl. ii., figs. 9-10 ("*breviculum*"), 1942.

## LENAMERIA QUOYI.

1882. *Physa quoyi* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 288, pl. vi., fig. 24, April 6. King George's Sound, South-west Australia.

## LENAMERIA TENUILIRATA.

1882. *Physa tenuilirata* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 291, pl. vi., fig. 27, April 6. Swan River, Western Australia.
1930. *Isidora decorata* Thiele, Die Fauna Sudwest. Austr., Vol. v., p. 587, fig. 65. Brancaster, S.W. Australia.

## LENAMERIA EXARATA.

1882. *Physa exarata* Smith, Journ. Linn. Soc. (Lond.), Vol. xvi., p. 292, pl. vi., fig. 28, April 6. "Depuch Island, Port Essington, N. Australia.

## LENAMERIA EGREGIA.

1906. *Limnaea (Bulinus) egregia* Preston, Proc. Malac. Soc. (Lond.), Vol. viii., p. 36, fig. in text, March 9. North-west Australia.

## LENAMERIA SISURNIA.

1918. *Bullinus sisurnius* Hedley, Proc. Roy. Geog. Soc. Austr. South Austr. Br., 1916-17, Moll., p. 20, pl. xli., figs. 5-7. Paterson Range, North-west Australia.

## LENAMERIA PYRAMIDATA.

1873. *Physa pyramidata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. viii., sp. 62, April. Australia = Flinders Island, Bass Strait (Milligan), fide Smith.
1874. *Physa eburnea* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. xi., sp. 89, figs. 89 a-b, November. Launceston, Tasmania.

## LENAMERIA ATTENUATA.

1874. *Physa attenuata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. xii., sp. 94, November. Dulverton Lake, mid-East Tasmania.
- [1876. *Physa ciliata* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 75, March 21, 1876. Lake Dulverton, Tasmania. Figd. May, loc. cit., 1920, p. 70, pl. ix., fig. 6 (? type).]

## LENAMERIA BRUNNIENSIS.

1874. *Physa brunniensis* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. xii., sp. 99, November. Brunni Island, S. Tasmania.

## LENAMERIA MAMILLATA.

1874. *Physa mamillata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. xi., sp. 90, November. Brunni Island, Tasmania (Legrand).

## LENAMERIA HUONENSIS.

1876. *Physa huonensis* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 74, March 21, 1876. Huon River, S. Tasmania.
1876. *Physa legrandi* Ten.-Woods, loc. cit. Richmond, Tasmania. Type figured May, op. cit., 1920, p. 70, pl. ix., fig. 7.
1876. *Physa tasmanica* Ten.-Woods, loc. cit. Inland streams. Type figured May, op. cit., 1920, p. 70, pl. ix., fig. 8.
1876. *Physa tasmanicola* Ten.-Woods, loc. cit., p. 75. Mount Murray, East Tasmania. Type figured May, op. cit., 1920, p. 70, pl. ix., fig. 9.
1876. *Physa huoncola* Ten.-Woods, loc. cit., p. 75. Upper Huon River, South Tasmania.

## LENAMERIA YARRAENSIS.

1878. *Physa yarraensis* Ten.-Woods, Proc. Roy. Soc. Vict., Vol. xiv., p. 64. Upper Yarra, Victoria. Figd. Hedley, Rec. Aust. Mus., Vol. xvi., p. 5, pl. ii., fig. 16, 1917.
- [1866. *Physa (Bulinus) acutispira* Tryon, Amer. Journ. Conch., Vol. ii., p. 9, pl. 2, fig. 10, January 1. Australia. Does not seem determinable.]
1882. *Physa etheridgii* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 288, pl. vi., fig. 25, April 6. Yan Yean Reservoir, Plenty District, Victoria.

## LENAMERIA ADAMSIANA.

1874. *Aplexa adamsiana* Tapparone-Canefri, Mem. R. Accad. Sci. Torino, Ser. 2, Vol. xxviii. (Zool. Magenta), p. 207, pl. iii., fig. 3. Australia, ex Cox = Sydney, New South Wales.

## LENAMERIA ACICULATA.

1873. *Physa aciculata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. viii., sp. 59, April. New South Wales.

## LENAMERIA TORTUOSA.

1886. *Physa tortuosa* Clessin, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth. xvii., p. 360, pl. 51, fig. 1. Urara River, New South Wales.
1886. *Physa multispirata* Clessin, loc. cit., p. 361, pl. 51, fig. 4. Same locality.
1882. *Physa producta* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 286, pl. vi., fig. 21, April 6. South Grafton, Clarence River, N.S.W. Not *Physa producta* Mighels, 1845 (Sherborn).

Note:—Gabriel has recorded this species from Victoria, giving a figure of "*pyramidata*," which he has transferred to *tenuistriata*, which is of later publication, and has figured as "*tenuistriata* var. *pyramidata*," a very different shell! Cotton has also misfigured *pyramidata*. Compare May's figure and Sowerby's original one.

## LENAMERIA BRISBANICA.

1879. *Physa brisbanica* Nelson & Taylor, Journ. Conch. (Leeds), Vol. ii., p. 288-89, pl. i., fig. 10, September-October. Brisbane River, Queensland.

## LENAMERIA QUEENSLANDICA.

1882. *Physa queenslandica* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 287, pl. vi., fig. 23, April 6. Dawson River, Queensland.

## LENAMERIA BEDDOMEI.

1879. *Physa beddomei* Nelson & Taylor, Journ. Conch. (Leeds), Vol. ii., p. 289, pl. i., fig. 8, October. Townsville, Queensland.

## LENAMERIA GRACILENTA.

1882. *Physa gracilentata* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 285, pl. vi., fig. 20, April 6. Endeavour Creek or River, Queensland.

## LENAMERIA LINCOLNENSIS.

1886. *Physa lincolnensis* Clessin, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth. xvii., p. 363, pl. 51, fig. 7. Port Lincoln, South Australia.

## Genus GLYPTAMODA, nov.

Type, *Physa aliciae* Reeve.

This group is well defined by its slender form and prominent sculpture, the apex elevated, papilliform, the mouth large oval, the columella folded.

## GLYPTAMODA ALICIAE.

1862. *Physa (Ameria) aliciae* Reeve, Proc. Zool. Soc. (Lond.), 1862, p. 106, fig. in text, June 1. Lower Murray River, South Australia.
1886. *Physa cingulata* Clessin, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth. xvii., p. 364, pl. 51, fig. 8. South Australia.

## GLYPTAMODA KERSHAWI.

1878. *Physa kershawi* Ten.-Woods, Trans. Roy. Soc. Vict., Vol. xiv., p. 64, July 11. Upper Yarra, Victoria. Figd. Hedley, Rec. Austr. Mus., Vol. xii., p. 6, pl. ii., fig. 17, December 19, 1917.
1881. *Amplexa turrita* Tate, Proc. Linn. Soc. N.S.W., Vol. vi., p. 409, December. Lake Wendouree, Ballarat, Victoria. Figd. Hedley, Rec. Austr. Mus., Vol. xii., p. 6, pl. i., fig. 14, December 19, 1917.
1881. *Physa turriculata* Tate & Brazier, Proc. Linn. Soc. N.S.W., Vol. vi., p. 558, December. New name for preceding or error only. Not *Physa turriculata* Morelet, 1868.

Hitherto the peculiar form has been regarded as restricted to South Australia and Victoria, but it apparently has an extensive range, as a large series from Goulburn, New South Wales, is under review. These recall the typical *aliciae*, but some are even larger, with coarser sculpture, the ridges more distant, the shell measuring 15 mm. in length by 7 mm. in breadth, the aperture being 9 mm. in length by 4 mm. in breadth. The species may be named *Glyptamoda ellea* sp. nov.

## GLYPTAMODA COSMETA, sp. nov.

A series of a small very delicate *Glyptamoda* was collected at Calala Lagoon, near Tamworth, northern New South Wales. The shell is small, elegant, measuring 7 mm. by 4 mm., very thin, brown, apex elevated, as figured by Hedley, about twenty major concentric lirae, with as many

minor ones, the interstices with fine radiating threads, forming a finely latticed appearance. The spire is very short, the mouth long and oval.

Genus TASMADORA, *nov.*

Type, *Physa aperta* Sowerby.

A curious isolated form having the appearance of an *Isidorella*, but with the columella strongly folded, the spire very short, less than half length of aperture.

TASMADORA APERTA.

1874. *Physa aperta* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. xi., sp. 88, November. Hamilton, Australia = Tasmania (Legrand).

Genus AMERIANNA.

1928. *Amerianna* Strand, Arch. für Nat. (Berlin), 29th Year, 1926, Abth. A, heft, 8, p. 63. New name for
1861. *Ameria* H. Adams, Proc. Zool. Soc. (Lond.), 1861, p. 143, September 16. Logotype, Cotton, 1942, *Physa truncata* H. Adams. Spelt *Armeria* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 295, 1885. Not *Ameria* Walker, List. Lep. B.M., pt. 2, p. 554, 1854.

AMERIANNA CARINATA.

1861. *Physa (Ameria) carinata* H. Adams, Proc. Zool. Soc. (Lond.), 1861, p. 143, September 16. Boyne River, Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. iii., sp. 18, February, 1873.
1861. *Physa (Ameria) truncata* H. Adams, loc. cit., p. 144. Calliope River, Australia. Figd. Sowerby, loc. cit., pl. iii., sp. 20. Not *Physa truncata*. Bourg., 1856.
1942. *Amerianna gabrieli* Cotton, Trans. Roy. Soc. South Austr., Vol. 66, p. 77, July 31. New name for *truncata*.

The two species are absolutely identical, and come from two rivers, adjacent, and with the same faunula. It is possible that the next is merely an ecological aberration, but is separable at present by its elevated apex, the others having the apex depressed. A specimen has been found in the Upper Clarence River, New South Wales.

AMERIANNA OBESULA, *nom. nov.*

1861. *Physa (Ameria) obesa* H. Adams, Proc. Zool. Soc. (Lond.), 1861, p. 144, September 16. Fitzroy River, Australia = Queensland. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. iii., sp. 24, February, 1873. Not *Physa obesa* De Kay, 1843.

Mr. H. Bernhard sent specimens from Yeppoon Lagoon with the tilted apex, and these seem distinct, but shells from the Burdekin River, further north, were figured by Sowerby as *truncata*.

AMERIANNA COMPAR, *sp. nov.*

Specimens from Lennard River, North-west Australia, are similar in shape to the Burdekin River shells, but differ in the flattened spire, which shows distinct concentric spiral striae; the height of the shell is 7 mm., the breadth 5.5 mm., the aperture 6.5 mm. by 3.5 mm., the shell very thin, colour fawn,

## AMERIANNA REEVII.

1864. *Physa (Ameria) reevii* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 417, April 20, 1864. Arnheim's Land. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. vi., fig. 40, February, 1873.

## AMERIANNA CUMINGII.

1861. *Physa (Ameria) cumingii* H. Adams, Proc. Zool. Soc. (Lond.), 1861, p. 144, September 16. Port Essington, Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. vi., sp. 44, February, 1873.

## AMERIANNA BONUSHENRICUS.

1864. *Physa (Ameria) bonus-henricus* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 417, April 20, 1864. Arnheim's Land. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. v., sp. 38, February, 1873. Refigd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 293, pl. vi., fig. 29, 1882.

From Smith's account and figures this does not seem a typical *Amerianna*.

## Genus OPPLETORA.

1938. *Oppletora* Iredale & Whitley, South Austr. Nat., Vol. xviii., p. 64, April 30. Haplotype, *Physopsis jukesii* H. Adams.

The truncate columella separates this at once from *Isidorella*.

## OPPLETORA JUKESII.

1861. *Physopsis jukesii* H. Adams, Proc. Zool. Soc. (Lond.), 1861, p. 144, September 16. Port Essington, Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. ix., sp. 71, April, 1873.

## Genus ISIDORELLA.

1896. *Isidorella* Tate, Rep. Horn Sci. Exped. Cent. Austr., pt. ii., Zool., p. 212, February. Orthotype, *Physa newcombi* A. Adams & Angas.

## ISIDORELLA NEWCOMBI.

1864. *Physa newcombi* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 416, April 20, 1864. Ponds at Mount Margaret, Central Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. iii., sp. 21, February, 1873.

## ISIDORELLA SUBINFLATA.

1874. *Physa subinflata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. i., sp. 5, fig. 6a (not fig. 5, fide Smith), November. South Australia.
1864. *Physa inflata* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1864, p. 39, June 24. Wakefield River, South Australia. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. i., sp. 4, November, 1874. Not *Physa inflata* Lea, Proc. Am. Phil. Soc., Vol. ii., p. 321, 1841.
1926. *Isidora newcombi hedleyi* Clench, Journ. Conch., Vol. xviii., p. 12, March. New name for preceding.

## ISIDORELLA RUBIDA.

1882. *Aplexa rubida* Tate, Trans. Roy. Soc. South Austr., Vol. iv., 1881, p. 76, January, 1882, ex Southern Science Record, Vol. i., p. 136, August, 1881, *nom. nud.* Franklin Harbour, South Australia. Figd. Cotton &

Godfrey, South Austr. Nat., Vol. xiii., p. 160, pl. 2, fig. 7, "August" = September 30, 1932.

## ISIDORELLA PILOSA.

1878. *Physa pilosa* Ten.-Woods, Trans. Roy. Soc. Vict., Vol. xiv., p. 63, July 11. (University Ponds), Melbourne, Victoria.
1878. *Physa crebriciliata* Ten.-Woods, loc. cit., p. 63. Caulfield, Victoria.
1886. *Physa ciliosa* Clessin, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth. xvii., p. 351, ex Martens MS. in synonymy.
1917. *Physa hirsuta* Hedley, Rec. Austr. Mus., Vol. xii., p. 7, pl. ii., fig. 21, December 19, ex Ten.-Woods MS., as types of *crebriciliata*; at the same place, fig. 19, the type of *pilosa* is figured.

## ISIDORELLA BRAZIERI.

1882. *Physa brazieri* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 286, pl. vi., fig. 22, April 6. Ashfield, near Sydney, N.S.W.
1882. *P. brazieri* var. *pallida*, id. ib. Chatsworth, N.S.W.
1886. *Physa contortula* Clessin, Syst. Conch. Cab. (Mart. & Chemnitz), ed. Kuster, Bd. I., Abth. xvii., p. 369, pl. 54, fig. 6. Australia.

ISIDORELLA MAJUSCULA, *nom. nov.*

1882. *Physa brazieri* var. *major* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 287, April 6. Burnett River, Queensland.

## ISIDORELLA PHYSOPSIS.

1887. *Limnaea physopsis* Cooke, Journ. Conch. (Leeds), Vol. v., p. 243, pl. ii., figs. 1-4, November 12. Paroo Creek, River Darling, Australia.

## ISIDORELLA FERRUGINEA.

1864. *Physa ferruginea* A. Adams & Angas, Proc. Zool. Soc. (Lond.), 1863, p. 416, April 20, 1864. Arnheim's Land. Figd. Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. iv., sp. 25, February, 1873.
- [1866. *Physa (Isidora) hainesii* Tryon, Amer. Journ. Conch., Vol. ii., p. 9, pl. 2, fig. 9, January 1. Australia.]
1873. *Physa latilabiata* Sowerby, Conch. Icon. (Reeve), Vol. xix., pl. v., sp. 33, February. Victoria River, Northern Australia.
1886. *Physa schayeri* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 366, ex Troschel MS. as synonym. *P. schayeri* Paetel, Cat. Conch. Samml., p. 116, 1873, *nom. nud.*, "V.D.L." (where none of this group lives).

ISIDORELLA BRADSHAWI, *sp. nov.*

Many specimens collected by Mr. F. R. Bradshaw at Tambellup, South-western Australia, are well inflated, the spire medium, mouth free, umbilical chink present, sculpture of growth lines only, coloration brown. Height, 11.5 mm.; breadth, 11 mm.; height of aperture, 7.5 mm.; breadth, 6 mm.

ISIDORELLA MOOLA, *sp. nov.*

A series collected by Mr. K. H. Bennett at Moolah, west New South Wales, shows a species very distinct from *physopsis*, having an elevated spire, recalling more the *subinflata* style, brown in coloration, finely

reticulately sculptured, mouth free, small umbilical chink present. The shell measures 19 mm. in height, 13 mm. in breadth, the aperture 11 mm. by 8 mm.

*ISIDORELLA MONTANA, sp. nov.*

Many specimens collected at Jindabyne, 3,200 ft., Mount Kosciusko, New South Wales, recall *pilosa* Ten.-Woods, in their covering, showing a cancellate periostracum ruffed at the sutures, but differing by their produced spire. The shells reveals a slight cancellation also, but on the last whorl the growth lines dominate. The shell measures 17 mm. in height by 11 mm. in breadth, the aperture measuring 10 mm. by 8 mm.

Family PLANORBIDAE.

It is difficult to determine these small disc-like molluscs as in the latest very conservative British List, while only two genera are admitted, no fewer than six subgenera are admitted, and these are ranked higher by most other authorities. None of our species ranks with the large *cornea*, one of the types of *Planorbis*, but now the name has been allotted to a smaller shell. It is obvious that none of our forms is congeneric with either of the accepted *Planorbis*, so that we must introduce names for ourselves. There seems to be at least three recognisable series, a very small form with rounded whorls and small rounded mouth of southern range, which may be called *Pygmanisus, scottiana* Johnston being named as type. A second series also more common in the south is large, whorls still rounded, mouth oblique, but in the same plane almost free, typified by *tasmanicus* Ten.-Woods, and which is here called *Plananisus*; whilst the third of northern, as well as southern range, is strongly keeled peripherally, with the mouth oblique and discontinuous, the surface commonly spirally sculptured, and is the largest of the three. This is called *Glyptanisus*, and the type is *Glyptanisus ordessus* sp. nov., hereafter described. It may be that many other forms exist, as there has been little search for these small fresh water molluscs as yet.

PYGMANISUS SCOTTIANUS.

1879. *Planorbis scottiana* Johnston, Papers Proc. Roy. Soc. Tasm., 1878, p. 26, February 24, 1879. Launceston, Tasmania. Figd. May, op. cit., 1920, p. 70, pl. x., fig. 12.

The genus is apparently well distributed on the continent as, though Gabriel records only one locality in Victoria, it ranges as far north as Armidale in northern New South Wales.

PYGMANISUS LEONATUS, sp. nov.

Specimens have been collected at Canberra, Yass, and Goulburn, in southern New South Wales, and these differ from the Tasmanian species in smaller size, flatter spire and less developed sculpture. The shell measures 2 mm. in breadth by .75 mm. in height, sculpture of growth lines dominant. Shells from Cooma seem even less.

PYGMANISUS PELORIUS, sp. nov.

A different species occurs at Armidale, N.S.W., of fewer whorls, but still rounded, the mouth also rounded, the spire more sunken, the sculpture of growth lines only, the shell measuring 2 mm. in breadth by .5 mm. in height.

## PLANANISUS TASMANICUS.

1876. *Planorbis tasmanicus* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 79, March 21, 1876. (Circular Head), Tasmania.

## PLANANISUS MCCOYI.

1939. *Planorbis McCoyi* Gabriel, Mem. Nat. Mus. Melb., No. 11, p. 121, pl. iii., figs. 27, 27a, 27b, November, ex Ten.-Woods MS for Victorian shell described and figured as "*tasmanicus* Ten.-Woods."

## PLANANISUS ISINGI.

1932. *Planorbis isingi* Cotton & Godfrey, South Austr. Nat., Vol. xiii., p. 162, pl. 3, figs. 9-10, August. Lake Alexandrina, South Australia.

Note:—*Planorbis obtusus* Sowerby, Conch. Icon. (Reeve), Vol. xx., pl. v., fig. 39, 1878, ex Deshayes MS, was described from Adelaide, South Australia. It does not appear to be an Australian shell, but in any case the name is invalid, being anticipated.

## PLANANISUS MACQUARIENSIS.

1882. *Planorbis macquariensis* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 295, pl. vii., figs. 4-6, April 6. Macquarie River, New South Wales.

## GLYPTANISUS MERIDIONALIS.

1875. *Planorbis meridionalis* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 20, April 27. Ouse River, Tasmania.
1889. *Planorbis cathcarti* Petterd, Papers Proc. Roy. Soc. Tasm., 1888, p. 68, pl. i., figs. 4, 5, 6, in synonymy. Figd. May, Papers Proc. Roy. Soc. Tasm., 1920, p. 70, pl. x., fig. 11.
- [1873. *Planorbis australianus* Paetel, Cat. Conch. Samm., p. 116, as of "Martyn." "Tasman." *Nomen nudum.*]

## GLYPTANISUS ATKINSONI.

1879. *Planorbis atkinsoni* Johnston, Papers Proc. Roy. Soc. Tasm., 1878, p. 26, February 24, 1879. South Esk, Tasmania. Figd. May, op. cit., 1920, p. 70, pl. x., fig. 10.

## GLYPTANISUS WATERHOUSEI.

1885. *Planorbis waterhousei* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 188, pl. 28, fig. 2. Clarence River, Australia = north New South Wales.

The shell figured by Gabriel (Mem. Nat. Mus. Melb., No. 11, p. 122, pl. iii., figs. 29a-b, November, 1939) from Portland, Victoria, under Clessin's name is certainly not this species, differing in the more rounded whorls, etc., and must be named *G. caroli* sp. nov.

## GLYPTANISUS ORDESSUS, sp. nov.

A large series from the Chichester Dam, Hunter River district, shows a species of the strongly keeled series, the keel median, spire sunken, upper side of whorl round, lower side only subkeeled, sculptured, in addition to the fine growth lines, with distant concentric striae, measuring 3 mm. by 1 mm. in height.

## GLYPTANISUS METAURUS, sp. nov.

Armidale, N.S.W., specimens differ in lack of concentric striation,

while the growth lines are very notable. The shell measures 3 mm. in breadth by 1 mm. in height, the medial keeling only prominent on the last whorl, the umbilicus wide, the mouth fairly large, oblique, and thin.

GLYPTANISUS GILBERTI.

1848. *Planorbis gilberti* Dunker, Proc. Zool. Soc. (Lond.), 1848, p. 40. New Holland (Gilbert). Figd. Sowerby, Conch. Icon. (Reeve), Vol. xx., pl. v., fig. 37, 1877. Refigd. Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 294, pl. vi., figs. 30-32, 1882.

This may be restricted to the Brisbane district, and specimens from Eidsvold, Queensland, be named *G. idenus* sp. nov., as they differ from Smith's account in their larger size, more descending mouth, more flattened base, less sunken spire, and finer sculpture. The shell measures 7 mm. in breadth by 2 mm. in height.

GLYPTANISUS BRAZIERI.

1885. *Planorbis brazieri* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 166, pl. 24, fig. 6. New name for  
1882. *Planorbis fragilis* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 294, pl. vii., figs. 1-3, April 6, ex Brazier MS. Ipswich, Queensland. Not *Planorbis fragilis* Dunker, 1850.

GLYPTANISUS PLANISSIMUS.

1885. *Planorbis planissimus* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 165, pl. 24, fig. 7, ex Schmeltz, Mus. Godeffroy, Cat. iv., p. 69, 1869, *nom. nud.* Cape York, Queensland.

GLYPTANISUS DAEMELI.

1885. *Planorbis daemeli* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 189, pl. 28, fig. 6. Cape York, Queensland.

Specimens from Lilysmere Lagoon, Burdekin River, Queensland, are larger and flatter than *daemeli*, and in addition to a very fine concentric striation shows strongly marked growth ridges, giving the shell a distinctive striped appearance. The shell measures 7 mm. in breadth by 2 mm. in height. This species may be called *G. stabilis* sp. nov.

GLYPTANISUS ESSINGTONENSIS.

1882. *Planorbis essingtonensis* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 294, pl. vi., figs. 33-35, April 6. Port Essington, North Australia.

GLYPTANISUS HESPERUS, *sp. nov.*

Specimens from the Lennard River, North-west Australia, are smaller than the preceding, more tightly coiled, deeper, mouth smaller, strongly keeled medially, finely concentrically striate throughout, growth lines obsolete. The shell measures 4 mm. in breadth, 1.5 mm. in depth.

GLYPTANISUS CORANUS, *nom. nov.*

1896. *Planorbis fragilis* Tate, Rep. Horn. Sci. Exped., pt. ii., Zool., p. 216, pl. xix., fig. 23, February. Palm Creek, Central Australia. Not *P. fragilis* Smith, 1882.

GLYPTANISUS SPERANUS, *sp. nov.*

A series from Narrabri, Namoi River, N.S.W., shows a tightly coiled sunken apex, recalling *Segnitila* from above, strongly keeled medially, upper and lower surfaces somewhat subkeeled above and below, the concentric striation obscured by growth lines. Breadth, 5 mm.; height, 1.75 mm.

## Genus SEGNITILA.

1938. *Segnitila* Cotton & Godfrey, Rec. South Austr. Mus., Vol. vi., p. 204, December 24. Orthotype, *Segmentina victoriae* Smith.

## SEGNITILA VICTORIAE.

1882. *Segmentina victoriae* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 296, pl. vii., figs. 11-13, April 6. Victoria.

## SEGNITILA AUSTRALIENSIS.

1882. *Segmentina australiensis* Smith, Journ. Linn. Soc. (Lond.), Vol. xvi., p. 296, pl. vii., figs. 7-10, April 6. Penrith, New South Wales.

SEGNITILA ALPHENA, *sp. nov.*

Specimens from Armidale, north N.S.W., are larger, with a narrower umbilicus and smaller mouth, and lack internal teeth. This seems to be the coastal form and is more like *victoriae* than the preceding, the umbilicus being only about one-fifth the width of the shell, measuring 1.1 mm. in a shell of 6 mm. width.

SEGNITILA OPPIDIA, *sp. nov.*

A smaller, more tightly wound species comes from Townsville, North Queensland, measuring 4 mm. in breadth by 1.5 mm. in depth, the umbilicus about one-fourth width, whorls five, very regularly coiled, last whorl not spreading, mouth fairly large.

## SEGNITILA MENISCOIDES.

1882. *Planorbis meniscoides* Tate, Trans. Roy. Soc. South Austr., Vol. v., p. 53, December. Port Darwin, North Australia.

Genus GLACIDORBIS, *nov.*

A series of Planorbid collected by Mr. C. Hedley from 35 feet, Blue Lake, Mount Kosciusko, New South Wales, provides a distinct genus, the shell being small, thin, three whorled, evenly coiled, mouth round, free, umbilicus wide, spire sunken, no sculpture, save growth lines observed. Nearest *Pygmanisus*, but differing in the few whorls and greater depth to breadth.

GLACIDORBIS HEDLEYI, *sp. nov.*

The shell measures 2 mm. in breadth by 1 mm. in height, coloration fine rich brown.

## Family ANCYLIDAE.

This family is probably unstable, as Bryant Walker has shown different groups, which even he, conservatively, regarded as of subfamily value. He would place some of our forms in connection with world-wide genera, not *Ancylus*, so that it will be better to use local names and prevent further confusion. The so-called "*Gundlachia*" seem to be aberrations, occurring under ecological conditions, as all the records appear to have been based on specimens from restricted localities. In order to keep this matter under

review, the two forms are kept separate in this List, but obviously our shells have nothing to do with the Cuban *Gundlachia*, whatever that may be.

Genus *PETTANCYLUS*, *nov.*

Type, *Ancylus tasmanicus* Ten.-Woods.

The distinction of the striate apex seems of little value phylogenetically, save in a local sense, and our southern "*Ancylus*" need not be classed with *Ferrissia* on that account.

*PETTANCYLUS TASMANICUS.*

1876. *Ancylus tasmanicus* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1875, p. 70, March 21, 1876. Hobart, Tasmania. Figd. May, loc. cit., 1920, p. 71, pl. x., figs. 15-16.

*PETTANCYLUS MARIAE.*

1902. *Ancylus mariae* Petterd, Papers Proc. Roy. Soc. Tasm., 1900-01, p. 1, June, 1902. Maria Island, South Tasmania. Figd. May, Illus. Index Tasm. Shells, pl. xli., fig. 21, 1923.

*PETTANCYLUS AUSTRALICUS.*

1880. *Ancylus australicus* Tate, Trans. Roy. Soc. South Austr., Vol. ii., p. 102, pl. iv., figs. 4a-b, December. River Torrens, Adelaide, S.A. Also misspelt *A. australis* B. Walker, Ancyliidae Sth. Afr., p. 10, 1913.

*PETTANCYLUS ASSIMILIS.*

1884. *Aynclus* (sic) *assimilis* Petterd, Journ. Conch. (Leeds), Vol. iv., p. 159, January. Richmond River, N.S.W.
1884. *Ancylus oblonga* Petterd, id. ib., *nomen nudum*. Not *A. oblongus* Forbes & Hanley, 1853.

*PETTANCYLUS SMITHI.*

1890. *Ancylus smithi* Cox, Proc. Linn. Soc. N.S.W., Ser. ii., Vol. iv., p. 658, pl. xix., figs. 1-3, February 3. Port Hacking River, National Park, Sydney, N.S.W.

*PETTANCYLUS OCCIDENTALIS, sp. nov.*

The Westralian Fresh Water Mollusca will prove as intriguing as the Land Mollusca as so little is known, and there seems to be numerous species. Mr. F. R. Bradshaw sent from Tambellup, S.W.A., a fine Ancyloid, which is here named. Other specimens collected earlier at Rottneest Island by Mr. L. Glauert probably belong to another species, but these minute shells need intensive study. However, the Tambellup shell is distinctive, being 5 mm. in length, 3 mm. in width, and 2 mm. in height. The apex is situated at about one-fifth from the posterior margin, the long anterior slope being gently curved, the whole shell delicately radiately striate. The shape is a lengthened oval, posteriorly a little narrowed, the sides straight, almost parallel.

*PETTANCYLUS IMPORTUNUS, sp. nov.*

Specimens collected by Consett Davis at Dry River, Quaamaa, near Bermagui, New South Wales, are like *tasmanicus*, but larger, even more elevated, with the apex situated even further back, and as usual excentric. The shell is oval, the anterior slope long and curved, the posterior slope

steep and concave. There seems a little striation with the concentric growth lines well marked. The shell measures 3.5 mm. in length, 2.25 mm. in breadth, and 2 mm. in height.

PETTANCYLUS DEXTRENUS, *sp. nov.*

1882. *Ancylus australicus* Smith, Journ. Linn. Soc. (Lond.), Zool., Vol. xvi., p. 297, pl. vii., figs. 36-37, April 6. North Australia (collected during the Port Essington Expedition, October 14, 1844). Mis-recorded *A. australiensis* Martens, Zool. Rec., 1882, Moll., p. 83, 1883.

As shown in the figures this differs from the southern *australicus* Tate, in form, and especially in the position of the apex. It is possible it belongs to a different genus, along with the next species.

PETTANCYLUS EPENUS, *sp. nov.*

Specimens from the Barrier Ranges (Derby), North-west Australia, measure 4 mm. in length by 2.5 mm. in breadth, and 1.5 mm. in height, and are obliquely oval, with the apex excentric with a twist to the right. Odhner noted "Apex at posterior third, anterior slope more convex than Smith's figure, shell more depressed and apex to right."

PETTANCYLUS ENIGMA, *sp. nov.*

Vast numbers from the Chichester Dam, Hunter River district, show many small, rather stout conical shell, recalling *tasmanicus*, and many others larger, with more parallel sides, and many suggest a rest period, and continuation in the same mode, not opposed as in "*Gundlachia*." The adult measures 3 mm. by 2 mm. broad, is smaller, more oblong than *A. smithi*, and is finely radially striate throughout. The smaller shells seem more coarsely striate. A monographer might find many species of so-called "*Ancylus*" in this country, but they are difficult to collect owing to their small size and habitat.

Genus PROBLANCYLUS, *nov.*

Type, *Gundlachia petterdi* Hedley = *eremia* Cotton & Godfrey.

When Johnston introduced the Cuban genus *Gundlachia* into Tasmanian conchology, little was known about the group. There is not much more, although over half a century has passed. Hedley did not accept the view that "*Gundlachia*" was an ecological aberration of an Ancyloid, but that may yet be proven. It is necessary to have a definite nomination in the meanwhile, so *Problancylus* is given for the southern capbearing Ancyloid. Hedley gave good figures of the two Tasmanian species, and anatomical details of the South Australian species since named *eremia*. Though Bryant Walker regarded the radula of the Cuban *ancyliiformis* as essentially similar to that of *Ferrissia*, and concluded that our Ancyloids might be classed in *Ferrissia*, the Australasian radula formula appear very different. Thus Suter gives the formula of his *G. neozelanica* as 9 + 5 + 1 + 5 + 9, Hedley recorded the radula of *eremia* of South Australia as having 70 rows of 8 + 12 + 1 + 12 + 8, essentially different. As *woodsii*, classed as an *Ancylus*, is regarded as the young of *petterdi*, which was placed in *Gundlachia*, examination of the radula should solve the problem. It may be noted that Gabriel has recorded species of *Ancylus* as collected at every locality credited with "*Gundlachia*," which is again suggestive.

PROBLANCYLUS PETTERDI.

1879. *Gundlachia petterdi* Johnston, Papers Proc. Roy. Soc. Tasm., 1878, p.

- 23, February 24, 1879 (Petterd Journ. Conch. (Leeds), Vol. i., p. 400, November, 1878, *nom. nud.*). First Basin, Launceston, Tasmania.
1879. *Ancylus woodsii* Johnston, loc. cit., p. 25. Figd. Hedley, Proc. Linn. Soc. N.S.W. (2), Vol. viii., pp. 505-514, pl. 24, figs. 1-3, June 5, 1894.

## PROBLANCYLUS BEDDOMEI.

1888. *Gundlachia beddomei* Petterd, Papers Proc. Roy. Soc. Tasm., 1887, p. 41, pl. xlv., Brown's River Road, South Tasmania. Figd. Hedley, op. cit., pl. 24, figs. 4-6.

## PROBLANCYLUS EREMIUS.

1938. *Gundlachia eremia* Cotton & Godfrey, Rec. South Austr. Mus., Vol. vi., p. 206, pl. xvii., figs. 2-3, December 24. Mount Lofty, South Australia. Figd. Hedley, op. cit., pl. 24, figs. 9-15.

## GENUS LEGRANDIA.

1879. *Legrandia* Legrand, Journ. Conch., Vol. ii., p. 95, March, ex Hanley MS. (*Legrandia* Legrand, 1872, as below, is a *nomen nudum*). Haplotype, *Ancylus cumingianus* Bourguignat.
1880. *Cumingia* Clessin, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xvii., p. 14, (recorded Z.R., 1880, Moll., p. 93). Haplotype, *Ancylus cumingianus* Bourguignat. Not *Cumingia* Sowerby, 1833.
1926. *Tasmancylus* Iredale, Nautilus, Vol. 39, p. 115. Orthotype, *A. cumingianus* Bourguignat. *Ancylastrum* Auct., not of Bourguignat, 1853.

## LEGRANDIA CUMINGIANA.

1854. *Ancylus cumingianus* Bourguignat, Proc. Zool. Soc. (Lond.), 1853, p. 91, pl. xxv., fig. 19, July 25, 1854 (ex Journ. de Conch., Vol. iv., p. 170, May 1, 1853, *nom. nud.*). Tasmania.
1872. *Legrandia maddocki* Legrand, Papers Proc. Roy. Soc. Tasm., 1871, p. 27, Report, ex Hanley MS. *Nomen nudum*.

## LEGRANDIA IRVINAE.

1888. *Ancylus irvinoe* Petterd, Proc. Roy. Soc. Tasm., 1887, p. 40, pl. xlv. The Great Lake, Tasmania. Mis-spelt *A. vivinae* Zool. Rec., 1888, Moll., p. 66, 1889.

Perhaps each of the big lakes in Tasmania maintains its own special faunulae, as a specimen from Lake St. Clair, sent by Petterd, is ribbed as in the Great Lake species, but is much narrower and more elevated, measuring 12 mm. in length, 9 mm. in breadth, basally, the apex overhanging another millimetre, while the height is 8 mm. In order to induce investigation this is here called *LEGRANDIA INSTIGATA*, sp. nov.